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NOVEMBER 25, 1939

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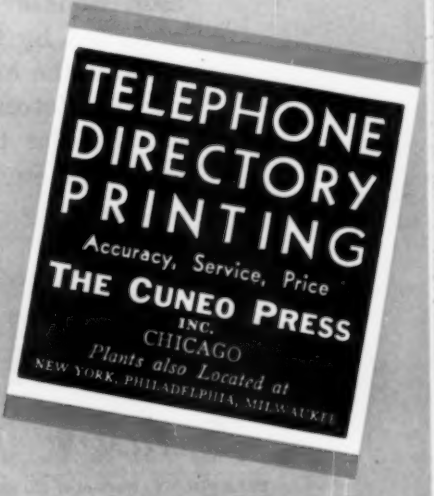

# LEICH SALES CORPORATION ANNOUNCES REMOVAL OF ITS OFFICES *and* WAREHOUSE

*to*

# NEW AND LARGER QUARTERS

## 427 W. RANDOLPH ST., CHICAGO

Effective Nov. 20, 1939, the offices of Leich Sales Corporation, formerly at 222 West Adams Street, Chicago, and the warehouse formerly at 429 West 14th Place, Chicago, will be combined at 427 West Randolph Street, Chicago, Illinois.

The new quarters, furnishing more than double the space previously occupied by the Company, are located in the heart of Chicago's shipping district and furnish unparalleled facilities for the swift shipment of telephone equipment, materials and supplies.

This expansion move is made in the interest of better service to the hundreds of independent telephone companies and telephone men who have been responsible for the growth of the Leich organization.

Telephones, construction materials and exchange supplies will be stocked in abundance to fulfill Leich's pledge of "Everything for the Telephone Industry." The present telephone number, Franklin 2931, will remain unchanged. Your orders and inquiries are cordially solicited.

# LEICH SALES CORPORATION

*Exclusive* DISTRIBUTORS *for* LEICH ELECTRIC COMPANY

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# Do Service Station Companies Control Quality of Exchange Service?

By L. D. DENSMORE
General Commercial Manager, Central Electric & Telephone Co., Sioux City, Iowa

***NO TELEPHONE COMPANY is properly discharging its obligation of public service so long as non-dependable, unsatisfactory service exists—regardless of who owns the plant or equipment. Exchange telephone companies should be helpfully interested in the rural service station companies' problems and provide the stimulus which will cause these rural organizations to improve service facilities. Address given before annual convention of South Dakota association***

IT IS THE obligation of every telephone company to furnish the best possible service to its subscribers at a reasonable cost. This imposes a duty to provide a service that will at all times be adequate, dependable and satisfactory to the user. Efficient operating personnel, sufficient and properly-maintained plant facilities are most essential if such service is to be assured.

Satisfactory plant conditions must exist in rural areas as well as in town. At many exchanges a very large portion of the telephone property in rural areas is owned by rural subscribers. Non-profit cooperative groups or companies have been formed, known as switched or service station companies.

Service station companies in some exchanges control the quality of exchange service furnished. Inadequate service over their lines means unsatisfactory telephone service to the entire community. Such conditions cannot exist if the principal obligation of the telephone company as a public servant is to be met.

### *Exchange Company Has Definite Responsibility*

The condition of service station lines and substation equipment must be satisfactory if adequate service is to be furnished. Although such plant is not owned or controlled by the telephone company, it does determine the quality of service furnished.

It, therefore, becomes a definite responsibility of the telephone company to be certain that service station plant is in proper operating condition at all times. The company is not properly discharging its obligations of public service so long as non-dependable, inadequate and unsatisfactory service exists, regardless of who may own the plant or equipment responsible for such service.

The taking over of service station lines by the telephone company is not the most practical solution. Practical operations from a cost standpoint should make this action the least desirable. The retention of lines by service station companies should be encouraged. The physical condition of such plant must be such that satisfactory and dependable service will be provided. Ways that this can be accomplished can and must be developed.

It is generally recognized that service provided over service station lines is poor. As a result the exchange service which is provided by the telephone company in many cases is adversely affected. Generally it can be said that the lines, with very few exceptions, are not of the type that is conducive to the furnishing of good service. A very large percentage of the service station lines is of the one-wire grounded circuit type.

Even before the influx of grounded rural electric lines, the service on these subscriber-owned lines was far from satisfactory. The situation has developed into a real problem, now that many of the lines are exposed to grounded electric parallels.

In addition to this the general condition of most of these lines is poor. Poles are deteriorated and missing; often wire is old and requires replacement. In many cases lines are in contact with fence wires and trees. These lines often present hazardous conditions which are menaces to all telephone property involved in the particular exchange. Tree conditions and high-resistance hand joints exist, with the result that transmission is very poor.

There are, of course, exceptions—some service station companies maintain their lines in first-class condition. This is the exception and not the rule. Service companies are, generally, poorly-organized and do not function effectively as a service

A modern farm must have a telephone. Satisfactory plant conditions should exist in rural areas as well as in town.

Some service station companies maintain their lines in first-class condition.

group. Meetings, as a general rule, are held annually; often little or no interest is shown and such meetings are poorly attended.

This is another indication of lack of interest shown by service station subscribers in their telephone activity. Often it is most difficult to find any member of a service station company who will assume the responsibility of handling the switching accounts; to say nothing of the responsibility for the lines and equipment.

### *Reasons for Poor Rural Line Conditions*

Good service is not appreciated by most of the rural line companies. These people have not experienced good telephone service in most cases and as a result do not realize its value and convenience. Invariably extremely poor service will be described by service station subscribers as "pretty good."

The lines and equipment of the companies, generally, are not properly maintained. Usually no constructive maintenance work is done until the condition of the line becomes so deplorable that the members jointly agree that, in order to give any service, they must get together and, as a group, do some work. Often many of the lines are overloaded.

The reasons for the unsatisfactory conditions, it seems, are natural in view of existing circumstances. The lines are owned by farmers. Farmers as a group are primarily interested in agriculture and its associated activities; they are not in the telephone business; they are not directly interested in the telephone business, and as a result the telephone problem is of secondary importance to them. It is very difficult to obtain unified and coordinated action on the part of farmers with respect to something that is entirely foreign to their industry.

The second reason for the unsatisfactory service condition appears to be a deficiency of the commercial telephone companies themselves. The telephone company, as a service institution, has failed in respect to the service station problem. In view of the nature of the service station enterprise, it should have been recognized by the exchange company that these service station companies do not function effectively without some outside stimulus.

Telephone companies have failed to recognize, or at least have failed to provide, this stimulus. A complete recognition by the exchange company of its responsibility in respect to service, and particularly to service station companies, is essential if real progress is to be made in rectifying the problem.

It is agreed generally among telephone men that the service station company has a definite place in the industry; that the lines should remain in service, and that steps should be taken to insure satisfactory service can be furnished by means of service station companies.

Many of the lines were constructed by the farmers as that was the only method by which they could obtain telephone communication. The service station company has provided, in many cases, the commercial company with rural coverage that would not have been possible but for the farmer line organization.

That a problem exists in connection with the situation cannot be denied. Having recognized the existence of this problem, and on the assumption that the commercial companies will accept some of the responsibility for the situation, we should consider what action is necessary to not only remedy, but to correct the situation.

Appreciation of the value of good service on the part of service station subscribers must be developed. This single factor appears to be the key to the entire problem. What can we do to develop this appreciation? What can we do to encourage service station companies to take interest in their lines? How can we make service over subscriber-owned and maintained lines adequate, satisfactory and dependable?

First, a close relationship should be developed and maintained with service station companies. We should be sufficiently alert and resourceful to stimulate the proper type of organization which will function effectively among the companies. Education of leading farmers and direct appeal to them to assume leadership is most necessary. This means that a great many of the service station companies would have to be reorganized.

Many of the lines were constructed by farmers as that was the only method by which they could obtain telephone communication.

The annual meetings of the companies afford excellent mediums for telephone companies to work with the groups. The telephone company should take the initiative in providing a suitable meeting place; should furnish refreshments, and, some form of entertainment at such meetings. The telephone company should also take the initiative in recognizing the problems of these rural companies; calling such problems to their attention, and recommending in detail the appropriate action required.

Prior to the annual meeting, the telephone company could arrange to have an inspection made of the service company's lines and at the time of the meeting present a full and complete report as to what is re-

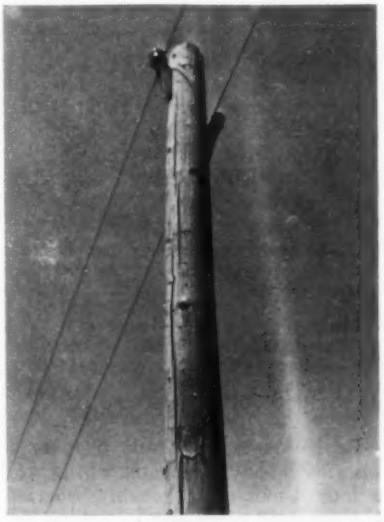
quired in order to place and to keep the lines in first-class condition. In other words, the telephone company should take the initiative in doing the engineering required for service line companies and in the direction of their improvement work.

### *Suggestions for Improved Rural Line Service*

At the present time a great many telephone companies repair telephone instruments for service station subscribers, but make a charge for such repairs. In view of the fact that it is almost impossible for service station subscribers to make their own repairs, it is imperative, in the interest of service, that these repairs be made correctly. One of the exchange company's contributions to the service line company should be the furnishing of labor for repair of service station instruments without cost to the subscriber.

The company could be most helpful in ordering the necessary materials and supplies for service line companies from regular suppliers, thus insuring a standard grade of materials. A supply of standard dry cell batteries should be maintained for sale to service station subscribers at actual cost. It would also be most helpful if service station companies had available standard maintenance tools which they could borrow. Having in mind the kind of tools that the service station subscribers use in attempting to maintain their lines, it is not surprising that transmission is not so good.

Attachment rates for service station lines should be made as low as possible in order that these companies will be in position to take advantage of existing pole lines of the telephone company and not duplicate pole line construction.



This illustration shows the use of brackets for supporting wires of a rural line.

Service station companies should be encouraged to make definite arrangements for maintenance responsibility. Then, whenever trouble occurs, it is definitely known, in advance, whose job it is to take action for clearing the trouble. These companies should be encouraged to make their regular assessments at amounts beyond the basis of switching calls in order to defray the cost of replacements and maintenance.

Much will be accomplished if the companies can be convinced that a little planning on their part, a little interest in the telephone service, a little additional money, comprise the only difference between good service and poor service. The telephone exchange company must lead the way, however, to this appreciation.

The success of the telephone company in solving the service station problem depends more upon the resourcefulness and the ability of the telephone manager, or employe who directly contacts the service line company, than on any other single factor. This job requires real sales ability and cannot be successful without genuine work and true effort on the part of the telephone company.

The manager or employe must appreciate that the service station situation is an important part of his job. The various functions of a manager's job should not be considered as being satisfactorily discharged so long as undesirable service station plant continues to exist in his exchange.

The Northwestern Bell Telephone Co. has published a booklet entitled "Keeping the Rural Telephone Alive." The booklet sets forth information relative to the construction and maintenance of subscriber-owned lines in such a manner that it would be most helpful in educating service line subscribers as to just what is required. A copy of this booklet should be placed in the hands of every service line subscriber in this territory.

If the service station situation is as here pointed out, it would seem that it is wholly unsatisfactory at the present time. The solution of the problem rests almost entirely with the telephone company assuming its proper responsibility; appreciating the seriousness of the problem and what is required for its correction.

Any solution will require much work, time and resourcefulness. The result, however, if accomplished, will be the solution to one of the most serious problems confronting the operator of telephone property having a large service station saturation.

A modern push brace has been put to good use on this rural telephone line.

## Tent Stake Disrupts Service of 100 Telephones

Manager George Laier of the Gothenburg, Neb., exchange of the Northwestern Bell Telephone Co., had an unusual experience recently when more than 100 telephones went dead at the same time. It was later found that the covering of a buried cable had been pierced when a stake was driven into the ground to support a tent used in a town celebration.

The ground, however, was so dry that no trouble resulted until the streets were sprinkled some days later. The hole left by the removal of the stake filled with water which saturated the paper insulation of the cable conductors, causing the service interruption.

## Recent Prices in the Metal Markets

New York, N. Y., November 20. Copper steady; electrolytic spot, 12.50; export, F. A. S., N. Y., 13.10. Tin firm; spot and nearby, 52.00; forward, 49.00. Lead steady; spot, New York, 5.50@5.55; East St. Louis, 5.35. Zinc steady; East St. Louis spot and forward, 6.50. Pig iron, No. 2, f.o.b. eastern Pennsylvania, 24.00; Buffalo, 23.00; Alabama, 19.38. Aluminum, virgin 99 per cent, 20.00. Antimony, Chinese spot, 14.00. Platinum, pure, 40.00.

# *in the Nation's Capital*

## *by Francis X. Welch*

Special Washington, D. C., Correspondent for TELEPHONY

***THREE UNRELATED events of last week are reminder that federal bureaucracy is slowly but surely on the march towards autocracy. . . . These events contain considerable food for thought for those who are sure that dictatorship "can't happen here." Comments show connection between these happenings and the effect upon the future of our country***

THE MOST important changes in the affairs of mankind come gradually, imperceptibly. Revolutions are really born, not out of the flashing words of the immediate firebrand but out of years of grievance. Dictatorships may appear to arrive with march of soldiers' feet; but if the popular groundwork has not been well prepared, they cannot long remain.

Three events, unrelated and perhaps not of colossal importance in themselves, took place in Washington last week. They serve to remind the thoughtful observer that federal bureaucracy is slowly but surely on the march towards autocracy, and that fundamental liberties of American life and American business may well be in jeopardy if, as, and when that goal is attained.

In the order of their appearance they were as follows: (1) A speech by TVA Power Director Lilienthal deploring the trend of bureaucratic control towards the nation's capital; (2) the enforced resignation of Major General Thomas Q. Ashburn from the presidency of the government-controlled Inland Waterways Corp.; and (3) the death of Justice Butler, which leaves Justice McReynolds the sole remaining old-school conservative justice on the U. S. Supreme Court bench.

Unconnected as these three items may appear at first glance, they each cast a passing reflection upon the steady, almost stealthy, progress of federal concentration of authority. And for those of us who are sure that dictatorship "can't happen here," there is considerable food for thought.

We are, perhaps, so preoccupied with guarding against the approach of dictatorship from the ranks of eccentric minorities that we are not paying much attention to what is going on right here in front of our eyes—something that may be happening so inconspicuously in the heart of our majority government control that it seems inconceivable that it could possibly be dictatorship in the bud.

But dictatorship can be just as much dictatorship in a business suit with a smiling official face as the kind that wears a funny colored shirt and military boots. No, if the unhappy day ever dawns when dictatorship comes to America, you may be sure it will not come goosestepping arrogantly into our nation's capital, rattling a sword and barking commands. We are too much on our guard against that sort of approach. More likely it will be some smooth-talking affable champion of the masses professing to "save" us from dictatorship itself.

If there is one lesson that we can learn from political history of the last quarter century, it should be: Look out for the fellow who wants to "save" the people from somebody else.

Communism rode into power on the strength of solemn promises to "save" the Russian masses from the yoke of Czaristic oppression. The Fascist legions of Mussolini first marched into Rome vowing to "save" the Italian people from Communism. Hitler turned the same slick trick in Germany. And there must be many a Russian, Italian, and German today who secretly prays: "Lord, deliver us from our deliverers."

THE SPEECH of David E. Lilienthal was made at Knoxville, Tenn., but it was made for the benefit of Washington. And you may be sure that Washington picked up its ears, for these were strange words to be coming from one who has been such a noted exponent of the New Deal in its most progressive phases.

Mr. Lilienthal isn't particularly worried about the "granting of additional responsibilities to the national government"; he regards that as a "victory for clear thinking." But he is worried very much over the problem of effective administration. He said:

> There is an urgent need for methods and procedures whereby the administration of essential national functions shall not become so concentrated at Washington, so overpowering in size and so distant from the everyday life of ordinary people as to undermine confidence in all governmental activities.

Of course, a lot of us have been worried about the same thing for a long time, and probably worried a great deal more about it than Mr. Lilienthal. But it is consoling to know that such a high official within

the administration has become even sensitive about the matter. The TVA director argues powerfully for decentralized or regionalized administration. He wants federal, state, local and private agencies to work together on problems of government. And he thinks that they never can work together unless as many decisions as possible are made right in the areas which are immediately affected by such decisions.

The TVA member also fervently urged "immigration of talent to the grass roots." For the last seven years the immigration has chiefly been in the direction of Washington. Unquestionably it would help and strengthen the country as a whole if more talent could be developed and thrive in the hinterlands. But under the present trend of government, talent in the grass roots would not have much chance, even if it should develop, because Washington is more and more insistent on running the whole shebang anyhow.

In the utility business, before the anti-holding company act was passed, we used to hear much sharp criticism from the New Dealers about "absentee management." They deplored the fact that local gas and electric companies in communities all over the United States affecting the welfare of millions of consumers and the investment of billions of dollars could be controlled to the most minute detail by a handful of men sitting in a top holding company office in New York.

But if concentrated financial control in New York is wrong, concentrated government control in Washington is equally wrong. The "absentee control" practiced in Washington today makes the holding company seem comparatively harmless. Your correspondent asked a cynical newspaper man in Washington what was really behind Mr. Lilienthal's Knoxville speech; and he summed it up in a sentence: "What Lilienthal really means is — Ickes, stay 'way from my door."

Yes, there have been rumors that the Secretary of Interior feels that all federal operations connected with power should become vassals of his department, including TVA, which has heretofore been conspicuously independent. The Interior Department is already in charge of the federal power program in California and along the Columbia river.

THIS BRINGS us to the strange case of General Ashburn whose resignation has thrown the administration into a minor convulsion. Even President Roosevelt is said to be very much disturbed over the crude way the General was given the bum's rush. But it is simply the result of another "reorganization" which, during the last few years, has always meant transferring control to Washington.

The Inland Waterways Corp. heretofore has been pretty independent. As a government agency it has had the unique reputation of being a commercial success; at least it has paid its own way, thanks to the ability of its leading spirit, General Ashburn. This corporation has control of the barge shipping business along the Mississippi and other inland waterways which the federal government picked up during the last World War.

A short while ago, however, the Inland Waterways Corp. was transferred from the nominal control of the War Department to the Commerce Department. Since that time the Secretary of Commerce and the Assistant Secretary of Commerce have been insisting that it should be run as a bureau of the Commerce Department instead of a business corporation. General Ashburn is said to feel that whatever success the corporation has attained in the past has been due to the very fact that it has been run just like any other business corporation with a minimum of outside bureaucratic interference.

But there was a clash of personalities. General Ashburn was practically fired and a successor, Chester Thompson, has already been appointed. As might be expected, Thompson is another lame duck Congressman (from Illinois) who was "taken care of." A full exposure

LAUGHING BY TOWERS
SIMS and LEE
REPAIR KIT
WOULD YOU SAY A FEW WORDS FOR 'THE MAN ON THE STREET PROGRAM'?"
WXYZ
"JENKS IS TRYING TO GET HIS COMMISSION REPORTS FIGURED OUT!"
OKONO TELEPHONE CO.
"OH, I SEE! IT'S SORT OF A GAME, SOMETHING LIKE GOLF - ONLY YOU'VE GOT TO GUESS WHAT HOLE TO PUT THE PLUG IN - IS THAT RIGHT!"
DO NOT DISTURB
QUIET ZONE
MEN AT WORK
QUIET
"NOW DON'T TELL ME WHO THIS IS, LET ME GUESS - I NEVER FORGET A FACE!"
"JENKINS, GET ME THAT OPERATOR WITH THE HIGH C VOICE!"

of the circumstances surrounding General Ashburn's retirement may be demanded when Congress reassembles. But meanwhile the incident serves to illustrate the steady trend of power in government operations from the seat of those operations to a handful of official offices in Washington.

This trend could not have occurred without some help by way of statutory authority. There have been many such laws passed since the New Deal came to power, and there may be more passed if it continues to remain in power. A few fell by the wayside, such as the original administrative reorganization bill which would have placed even the regulatory commissions—such as the FCC—under the power of a Cabinet department by changing them to subordinate bureaus. But the urge is still there to try again, if political fortune should improve the chances.

Even the passage of such legislation would not have been effective in shifting these great powers to Washington if the U. S. Supreme Court had remained the way it was when the New Deal was inaugurated. And that brings us to the passing of Justice Butler.

HIS CRITICS admitted that Justice Butler was an able, honest, and fearless judge. He was often called reactionary. But actually he was what the law students used to call a "law-is-law" man. His formula for constitutional construction was really very simple. He believed that the law meant exactly what it said, no more and no less. He rejected tenuous implications, no matter how popular the demand for them might be. He was a great respecter of precedent and consistency. He further believed that it was his duty to apply his principles whether or not such application was popular, and apply them he did.

"Interstate commerce" for him meant just that—a physical movement over state lines. He would not accept as a substitute any such rationalization as the theory of "matters affecting interstate commerce."

Your correspondent once heard Butler say that an unpopular court decision was a challenge to true democracy because it awoke the people to a situation which they should change by their vote if it did not suit them. This, he thought, was the democratic way of accomplishing fundamental change and preferable to reliance upon the courts to go along interpreting the passing fancy of the people by weaving it into a pattern of judge-made constitutional law.

In short, Butler was the sort of judge who in one set of circumstances would be denounced as narrow and autocratic; and under different conditions would be applauded as a courageous, strong champion of the law against the tide of misguided popular feeling.

In view of the controversy provoked by President Roosevelt's ill-fated Supreme Court enlargement bill, it was probably just as well for the court itself that a majority of the justices were not as strict bitter-enders as Butler and his colleague, McReynolds. Such rigidity on the part of the majority would probably have resulted in wrecking the court itself. But, on the other hand, it is unfortunate that Butler's restraining influence will no longer be felt. One by one conservatives have dropped off the bench and their places have been taken by candidates whose views on constitutional law were pretty well known in advance.

And thus the U. S. Supreme Court threatens to pass out of the picture, at least for the next couple of decades, as a guardian against the assumption of more and more control by the central government. With the appointment of a majority of new, young, "anything-goes" type of justices, the march of bureaucracy is pretty sure of having a green light at the U. S. Supreme Court for many years to come. If it is to be stopped at all, Congress and the votes of the people will have to erect the barrier.

THE SURRENDER of the Annenberg racing information empire to the forces of law and order in Chicago will probably have the practical effect of taking some of the punch out of the FCC recommendation for legislation to prevent commercial communications being used for such purposes. Theoretically, of course, as the law now stands the position of the telephone and telegraph industries and of the FCC in this matter is still pretty much up in the air.

And there is no guaranty that another sporting *entrepreneur* may not make a similar try for the profitable awards that were said to have accrued to the Annenberg organization. For that matter, both government officials and sporting gentry seem to be a little surprised that Annenberg threw up the sponge with so little struggle. There is some suspicion that the enterprising Philadelphia publisher may have "other plans."

Be that as it may, the telephone and telegraph industries are apparently rid of a pestiferous headache. Since Congress is now likely to take the attitude (regarding the FCC recommendation) that there is no longer practical necessity for a federal law on the subject, the industry stands a good chance to escape another restrictive piece of legislation which might easily result in unforeseen complications to make the life of the average telephone executive that much harder.

## Best Story of the Week—What's Yours?

The Gallipolis (Ohio) Bulletin of June 6, 1882, contained this item:

"Mr. Will Betz had a fine bull terrier dog. Last week while playing it ran with such violence against a telephone pole that it broke its neck and died instantly."

In sending in this story "Doc" Swoyer of the Ohio Bell Telephone Co., Columbus, comments: "Telephone service was established in Gallipolis, April 28, 1882, about a month before the dog's accidental death. Probably the dog had not learned the real purpose of telephone poles. Present-day dogs use poles for other purposes than suicide; and automobiles knock 'em down."

## Canadian Companies Form Rural Telephone Federation

At a meeting held October 18 at Mallorytown, Ontario, Can., a new organization known as the Leeds & Grenville Rural Telephone Federation was formed. It is representative of 12 Independent telephone companies operating in Leeds and Grenville counties of which Brockville is the county seat.

Officers elected for the ensuing term are: President, I. E. Lockwood, Newbliss, secretary of the Rural Telephone Co. of Kitley, Ltd.; vice-president, A. L. Campbell, Elgin, president of the South Crosby Rural Telephone Co., Ltd.; and secretary-treasurer, Miss Berniece M. Eyre, North Augusta, secretary-treasurer of the Leeds & Grenville Independent Telephone Co., Ltd.

The executive committee is composed of F. L. Bissell, Algonquin, president of the Leeds and Grenville company, and John Beatty, Mallorytown, secretary of the Mallorytown Telephone Co., Ltd.

# Conversion of Small Exchanges

# To Dial Service

By T. L. FRANK

Building and Equipment Engineer, Northwestern Bell Telephone Co., Omaha, Neb.

***OPERATION PROBLEMS** of small exchanges are creating interest in installation of automatic dial equipment. Three factors, which should be considered in converting to automatic equipment, are discussed in this paper read before convention of South Dakota Telephone Association*

EXCHANGES in the 500-station or less classification which predominate in South Dakota have operation problems that are very familiar to telephone men. In the past few years managers of many of these exchanges have been asking what dial equipment has to offer them in the way of service, maintenance and operation.

Dial service offers a uniform speed of service; complete freedom to make calls at night as well as in the daytime; increased privacy, and new and better instruments. The machine ringing is more insistent and the codes on rural lines are spaced more accurately; this means more prompt response and fewer wrong answers.

Subscribers get rid of the crank which, rightfully or wrongly, is considered by many as a symbol of the "horse and buggy" days. To be sure the subscribers now have a dial to turn, but the dial is a symbol of modern telephone equipment. That dial service is really more pleasing and more valuable to the subscribers is indicated by the fact that the calling rate usually is increased materially after a conversion.

More might be said about advantages of dial service, but let us discuss three of the many factors which should be considered in converting to dial operation: (1) Capabilities of the central office equipment; (2) equipping stations with dials and making certain the lines are suitable for dial operation; and (3) the trunking arrangements to toll centers.

The capabilities of the central office equipment may be summarized as follows: The equipment produced by the several manufacturers is highly ingenious, flexible and reliable, and will meet nearly all situations likely to be encountered.

T. L. FRANK, in reviewing trend toward automatic dial installations in rural exchanges, stated it is a continuation of the national progress in simplifying the operator's work and having more work done by the machine.

The equipment will furnish one, two or four-party selective service; PBX trunk hunting; 5, 10, and 20-code ringing; arrangements for handling grounded lines, and coin-box service, usually on a post-pay basis. Some of the lines may be arranged for extended scope or district service. Line-lockout may be obtained, which will take care of shorts, grounds, partial dials, failures to hang up at the end of a conversation, etc. In general the smaller equipment is not arranged to give intercepting service.

The equipment is usually arranged with alarms which will indicate minor, major, or complete failures. Two methods are available to bring the alarms to the attention of the maintenance man or an operator.

Under the first plan certain numbers are assigned which are connected to the alarm equipment. The maintenance man or an operator at the toll center may then dial these numbers periodically and, by means of distinctive tones or the complete absence of tones, determine the seriousness of the trouble. For instance, the operation of a line-lockout due to a shorted line will produce a minor alarm tone which may be the busy signal. A more serious condition, such as a blown fuse, would be indicated by another tone. The complete absence of signals would indicate a dead office and an emergency condition.

The second method of bringing the alarms to the attention of the proper party involves what is known as an "alarm-sender." When this device is installed and a failure occurs, the alarm-sender equipment immediately seizes a trunk to the operator and hence brings the condition to her attention promptly. This device, therefore, reduces the time which usually elapses before a case of trouble is detected.

The successful operation of the equipment may require some heat during extremely cold weather. Just how low we may permit the temperature to drop in these small offices is somewhat of a question. There are many reports of successful operation down to zero, but at that temperature we are flirting with danger. Not only have there been some failures due to changes of alignment of springs and terminals, and insulation shrinkage, but we also have cut the capacity of the battery in half at zero as compared with 70 degrees.

If there should be a failure of the commercial power at such a time, the batteries might soon play out

and result in a total service failure. It should be pointed out that even though the outside temperature may drop to 15 degrees or 20 degrees below during the night, the temperature inside drops to zero only after long periods of weather well below zero. The equipment itself gives off some heat which is useful in raising the temperature in the room.

Sometimes arrangements can be made to have someone light the stove in exceedingly cold weather. In some instances, electric heaters have been employed which are turned on thermostatically when the temperature drops to zero or thereabouts.

Manufacturers have incorporated many safety devices in their equipment, all of which are designed to protect the service. One or two may be cited to illustrate them. Duplicate ringing equipments are generally provided, and arrangements are available to have the second machine cut into service automatically if the first machine stops, and then the alarm is given.

The line lockout is a device associated with each line. If a line becomes shorted, or what telephone men generally call "permanent," a timing device starts which disconnects the line from the switching equipment, locks this line out of service and gives an alarm. Thus, a heavy rain or some cable trouble will not tie up all of the switching equipment and put the office out of service.

There is also a device known as an "allotter," which causes the trunks to the toll center to be selected in rotation. If a subscriber runs into an open trunk on his first call, a second attempt will insure that he reaches the second trunk and have a better chance of completing his call.

One of the questions which any manager of a small exchange will ask is this: "What about the physical condition of the long exchange lines, particularly the service lines, and within what limits will central office equipment work?"

The manufacturers are to be given credit for having developed equipment which performs amazingly well on long, heavily-loaded and grounded lines. Not only can lines of considerable length be operated successfully, but there is considerable tolerance of leakage across the line or to the ground. Manufacturers have endeavored to provide equipment that can be made to work over any circuit on which magneto signaling is working today.

From the telephone manager's standpoint, however, the very long lines need a little further scrutiny. We all know that in some instances, particularly in the case of the small service companies sometimes known as farmer-owned companies, the magneto lines are scarcely what might be called workable.

There are times when, due to wet weather conditions or other factors, the most distant stations cannot even signal the central office reliably, and often someone near the office actually repeats the signal for them. Many of these lines are long not only from a mileage standpoint but are long electrically, because there are many poorly-made joints, often of the plain hooked or hay-wire variety. And these introduce resistances which change with the weather and the wind.

Since with dial operation the battery supply for dialing is furnished by the central office, and the calling station must control the switches at the central office, we could hardly expect that lines of this kind would work satisfactorily without some attention. Certainly, high-resistance joints should be cut out so as to get the total resistance of the line down as low as the length of the line and type of wire used will permit. Broken or missing insulators should be replaced, and a reasonable amount of attention paid to leakage due to trees.

With grounded lines, we need to look to the grounds themselves. Frequently they introduce an additional 50 or 100 ohms, particularly in some soils and in dry weather. It may be advisable to provide several ground rods in place of one, and at times it may even be necessary to secure a good ground by running a wire to the well or some other known good ground.

Where the telephone company owns the rural lines, this work obviously is done at its expense. Where there are service lines, arrangements must be made to have them improve the lines as required for satisfactory operation. This may mean assisting the owners in preparing a list of required material and perhaps offering some advice. The telephone company has a real interest in seeing that their (the service companies) portion of the work is carried out satisfactorily and on time, since the service-line subscribers are a part of the whole exchange, and of the state and national service.

There is also the question of instruments. Every set, of course, has to be provided with a dial. Generally speaking, the town subscribers are furnished common battery service —that is, the battery for the transmitter is furnished from the central office—and frequently new common battery instruments equipped with dials are provided. On the rural lines—and that includes service lines — common battery service is generally possible on only the short and the lightly-loaded lines.

Of course, from the telephone company standpoint, we would like to make all of the rural lines common battery talking. However, we are up against two things: There is the decreased transmitter battery supply due to the resistance of the line which may in itself impose local battery talking. Then, we also have the human element to consider.

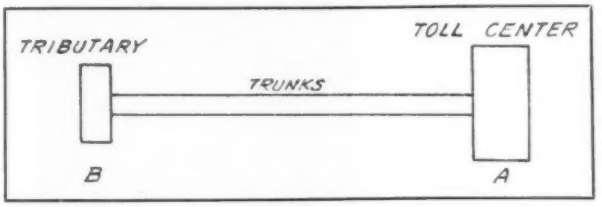



Fig. 1. The trunking plan, where tributary office has one or more circuits to the toll center, is fairly simple.

We all know that there is a good deal of listening-in on rural lines. Whatever telephone men may think of this practice, the fact remains that many subscribers consider listening-in a valuable feature of telephone service; and it is useless to expect that they will give up that practice just because the service is converted to dial.

With these conditions, local batteries to supply the current for the transmitters for the majority of the rural stations seem a necessity. It may be well to point out, however, that even though there are local dry cells for furnishing the transmitter current, the dialing operation itself, which operates the switches at the central office, is accomplished through the use of the central office battery.

Since local batteries are required at many stations, there is naturally a disposition to retain existing rural sets and to add dials. As much travel time is involved, an attempt has been made in some instances to have the installer add a dial to the instrument on the subscriber's prem-

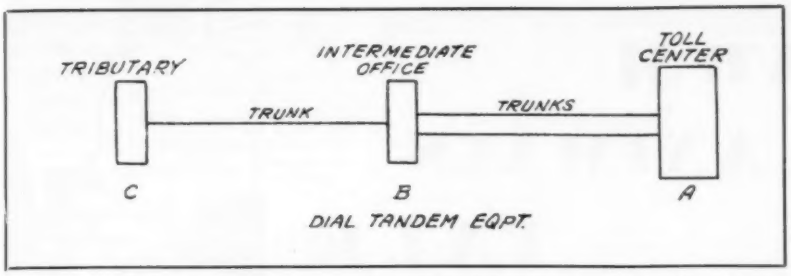



Fig. 2. Trunking plan where tributary office reaches toll center by switching through an intermediate manual office.

ises and thus avoid any change of instrument.

For owned stations, this has not in general been very satisfactory. Very often, the older sets should have some repair work and refinishing done; and, after all, the subscriber's home is a poor place in which to trace out complicated or unknown circuits, to bore large holes, run wires and solder connections.

It has, therefore, been our general practice to have the installer take out to the farmer a set which has previously been equipped with a dial in the shop, or a new set. The recovered sets may then be junked; or they may be repaired in the shop, placed in first-class condition and equipped with dials if tests show such treatment is warranted.

In the case of farmer-owned or service stations, additional complications arise. The telephone company usually does not own the set, and in some instances the telephone subscriber is a renter and the instrument is owned by the owner of the farm. The renter may be reluctant to invest money in an instrument.

Various treatments have been employed by different telephone companies, depending upon local conditions, including such things as the adequacy of the switching rate, the type of service contract, etc. Whatever treatment is proposed, it must always be remembered that the treatment must be acceptable to practically all subscribers in order to avoid ill-will and a loss of stations. Furthermore, the same general treatment must be applied to all the subscribers in an exchange. Where a company owns several or many exchanges, there must be a fairly consistent policy.

Sometimes, the service subscribers will gladly accept a rental-instrument plan under which the telephone company rents them instruments equipped with dials. These may be instruments which have been recovered from the owned lines and have been repaired and equipped with dials. The rented instruments remain the property of the telephone company, and the subscriber agrees to furnish the local battery as he has in the past.

In some instances, the service line subscribers may desire to make the repairs, but often such a plan is impracticable. The telephone set is a somewhat complicated bit of apparatus and the dial adds complications. So, in some cases, the company has agreed to make the repairs if the subscriber will bring the set to the office. The service subscriber may, of course, be furnished with another set and the returned set repaired at convenience.

As previously stated the telephone companies have a real interest in the problems of the service station subscriber, since he is part of the general exchange service; and satisfactory arrangements must be worked out with the service station subscribers in order to give the best service to all subscribers.

Let us now discuss the trunking arrangements for handling assistance and toll traffic. Assistance traffic usually consists largely of calls for information regarding numbers, time of day, dialing, etc. Where the company converting an exchange to dial service owns only the one exchange and maintains an office for the manager, this office may handle the assistance calls. During hours when the office is closed, calls are sometimes answered at the home of the manager or by some other employe.

If a company owns several nearby exchanges, the assistance calls in the smaller exchange are sometimes handled at the larger one, particularly if the latter has manual service. Where the company also operates a nearby toll center, as is often the case, it seems logical to have the toll center operator handle the assistance calls.

In order to handle toll calls, means are provided for reaching the toll center. As far as the subscribers are concerned, this is usually accomplished by dialing a single "0." Where the tributary office has one or more direct circuits to the toll center, the trunking plan is fairly simple, as illustrated in Fig. 1. However, there are some tributary exchanges today which reach their toll centers by switching through an intermediate manual office. This condition is illustrated in Fig. 2.

If this intermediate office is also a dial office, some additional equipment is required. In general, it is undesirable to have the subscribers at tributary "C" dial more than a single "0" in order to reach a toll center. Therefore, the trunks and the tandem switches at the inter-

*(Please turn to page 48)*

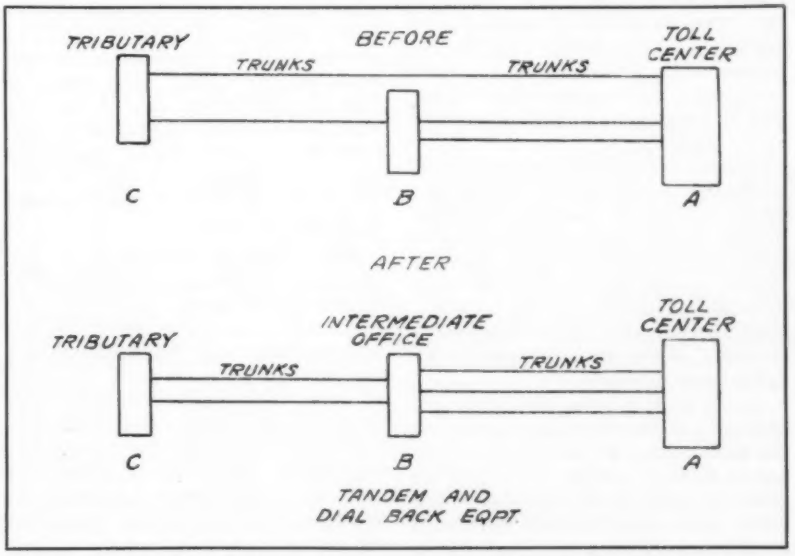



Fig. 3. A problem of "back-haul" in automatic switching of toll lines through an intermediate office.

# FARM ANIMALS TALK

## In Telephone Ads

***SERIES OF** advertisements in rural newspapers effectively tell New York state farmers of advantages of telephone service. Protection value of telephone featured most. Social benefits of telephone are pointed out, also value in finding outside work and in running farm business. Results of this type advertising have been good*

IS MY TAIL SINGED! THAT FIRE LAST NIGHT WAS TOO CLOSE FOR COMFORT!
YOU SAID IT! AND IF THEY HADN'T BEEN ABLE TO GET THE NEIGHBORS RIGHT AWAY ON THE TELEPHONE THE HOUSE WOULD HAVE GONE TOO!

They're talking horse sense.

A telephone is a real protection to home, barn, poultry houses—all your valuable farm property—in case of fire. Sound the alarm by telephone, and you can get help from neighbors or the fire department before a fire gains too much headway. Your farm investment needs the protection that only a telephone can bring.

NEW YORK TELEPHONE COMPANY

*A Farm Telephone Costs from 6¢ to 10¢ a Day. Ask Our Business Office for the Exact Rate in Your Locality*

Wise as owls—these ducks!

A telephone can save precious seconds when there's an accident or sudden illness in the home. When you can telephone, help is never far away; and you can always find out what to do until the doctor comes. Your family deserves the all year 'round protection that only a telephone can give.

NEW YORK TELEPHONE COMPANY

*A Farm Telephone Costs from 6¢ to 10¢ a Day. Ask Our Business Office for the Exact Rate in Your Locality*

DUCKS "as wise as owls," horses "talking horse sense," dogs that "are certainly not barking up the wrong tree"—these and many other farm animals, and even insects, tell New York state farmers of the advantages of having a telephone. They appear in the current series of farm advertisements of the New York Telephone Co. The series of 27 insertions in cartoon style is being run in 181 papers with a preponderant rural circulation in upstate New York. The advertisements are two columns by 10 inches.

Approximately half of the advertisements in the current series talk of the protection that the telephone brings to the family on the farm, with particular emphasis upon its use during emergencies—when there is sudden illness or an accident, when a valuable farm animal is stricken, when fire threatens valuable farm property.

In the remainder of the series the emphasis is placed about equally on the social value of the telephone, its use in finding outside work, and its value in running the business of the farm—arranging to share work with neighbors, reducing time lost due to machinery breakdowns, etc.

This division of the series of advertisements was made after consultations with salesmen who in an extensive canvass of rural areas in 1937 learned that most farmers in upstate New York gave as the reason for wanting a telephone its dependability in emergencies.

The advertisements devoted to the subject of "odd jobs" were included after salesmen reported that a good many prospects for farm telephone service were not farmers in the true sense of the word. They were, in fact, people living in the country who derived their livelihood in part from farming but mostly from work either in nearby metropolitan centers or at odd jobs for other farmers or summer residents.

The New York Telephone Co. has been talking to farmers by means of special advertisements in the rural press since the fall of 1933. Actual testimonials from farmers in various parts of the state as to the value of farm telephone service were first used. These were discontinued in 1937, but the farm advertising was still based upon actual cases and cited the value of the telephone under typical circumstances. The present series, begun in January of this year, has met with a ready response from farmer-readers, judging from comment received by rural editors from subscribers.

Having animals speak to deliver a message is, of course, as old as Aesop's Fables, and probably a great deal older. This age-old method of "teaching a moral" has been coupled in these New York Telephone Co. advertisements with the interest-provoking animal cartoon that is the standby in the humor departments of farm magazines.

It is believed also that the cartoons have added reader interest value when used in the small rural papers because of the scarcity of cartoon material available to these papers. "I can't remember a time," says one editor, "when I received as many favorable comments from rural subscribers about advertising appearing in my paper as I have about one of the current series of cartoon telephone ads. In my opinion, you are 'ringing the bell' with that kind of copy."

Animal cartoons permit the use of humor but it is a quiet kind of humor, consistent with the seriousness of the message conveyed. A tabby cat and a collie dog tell what the telephone means to the woman of the farm since the daughter

*(Please turn to page 33)*

HE'S A BOUNCING BOY ALL RIGHT! GOOD LUNGS TOO...
SURE HAS. I'M GLAD THEY'VE GOT A TELEPHONE SO THEY CAN KEEP IN TOUCH WITH THE DOCTOR
THE BOSS IS CERTAINLY GIVING THE FOXES A REST THESE DAYS—
HE'S HAD SO MANY ODD JOBS TO DO SINCE HE GOT THAT TELEPHONE THAT WE ONLY SEE HIM AT MEALTIMES
THAT TELEPHONE HAS CERTAINLY FILLED THE GAP SINCE MARY MOVED AWAY
THERE'S HARDLY A DAY THAT SOMEONE IN THE FAMILY DOESN'T CALL HER UP. IT KEEPS THE MISSUS FROM BEING LONELY
THAT WAS A CLOSE CALL FLOSSIE HAD LAST NIGHT
IT SURE WAS. GOOD THING THE VET COULD TELL THEM BY TELEPHONE WHAT TO DO UNTIL HE GOT HERE
THAT WAS A BAD SPELL OF CROUP LITTLE BOBBY HAD LAST NIGHT
I HEARD THE MISSUS SAY THE TELEPHONE HELPED A LOT. SHE GOT THE DOCTOR RIGHT AWAY
BOY, THE NEIGHBORS MADE QUICK WORK OF THAT FIRE AT THE HOUSE LAST NIGHT
THEY SURE DID. THERE'S NOTHING LIKE A TELEPHONE TO GET HELP IN A HURRY

They're talking about the new baby in the house.

If there's a new arrival in your home, you need a telephone more than ever. It saves a lot of worry—makes it easy to keep in touch with the doctor and with those who can give you good advice when ailment waits advertise that something's wrong. And even if there isn't a new baby at your house, you and your family need the protection and peace of mind a telephone brings.

NEW YORK TELEPHONE COMPANY

*A Farm Telephone Costs from 4¢ to 10¢ a Day. Ask Our Business Office for the Exact Rate in Your Locality*

These hounds are right; more odd jobs do come to those who have telephones.

If you're "receiving out," the telephone can help you a lot to get steady work. Those who have odd jobs to be done, give them first to the man with a telephone. By telephone they can arrange quickly to have a job done, plan the work, make changes as the job goes along. More jobs come to you if you have a telephone.

NEW YORK TELEPHONE COMPANY

*A Farm Telephone Costs from 4¢ to 10¢ a Day. Ask Our Business Office for the Exact Rate in Your Locality*

Even a cat and a dog can agree on to the value of a telephone in this home where the daughter has married and moved away.

It's easy to keep in touch with friends, neighbors and married children who have moved away—when you have a telephone; you can hear news of their doings, and tell them what is happening in your home. Younger children, too, find the telephone a real help in keeping in touch with school, club and church affairs. In fact, you will be doing a big thing for all the family when you get a telephone.

NEW YORK TELEPHONE COMPANY

*A Farm Telephone Costs from 4¢ to 10¢ a Day. Ask Our Business Office for the Exact Rate in Your Locality*

These cows are more contented because there is a telephone on this farm. And why wouldn't they be?

By telephone you can reach the veterinarian in a hurry when valuable live stock is in danger—find out what to do until he can get there. This saving of minutes may mean the difference between losing and saving a good animal. A telephone is real protection for your farm animals.

NEW YORK TELEPHONE COMPANY

*A Farm Telephone Costs from 4¢ to 10¢ a Day. Ask Our Business Office for the Exact Rate in Your Locality*

Although they're just out of the shell, these baby chicks already are pretty smart little roosters.

When there's sudden illness in the home—day or night—it's a real help to have a telephone. There are no minutes wasted in going for help. A quick call to the doctor brings valuable advice and the relief that comes from knowing what to do until he arrives. No doubt about it, a telephone means greater safety for you and your family.

NEW YORK TELEPHONE COMPANY

*A Farm Telephone Costs from 4¢ to 10¢ a Day. Ask Our Business Office for the Exact Rate in Your Locality*

Although these fellows are still too young to have had their noses pushed into a milk pail, they can tell the value of a phone, plain as a barn door.

When fire threatens your property, it pays to have a telephone. By telephone you can summon neighbors, or the fire department, and have a better chance to get at the fire before it does serious damage and spreads to other farm buildings. In fire, sickness, or other emergency, a telephone can bring help in a hurry—it's a real protection to your buildings, your livestock, your family.

NEW YORK TELEPHONE COMPANY

*A Farm Telephone Costs only 4¢ to 10¢ a Day. Ask Our Business Office for the Exact Rate in Your Locality*

THEY CERTAINLY GOT THAT FIELD PLOWED AND HARROWED IN A HURRY
YES, THEY JUST PHONED THE NEIGHBORS AND TRADED WORK WITH THEM
BOSSY WAS A PRETTY SICK COW LAST NIGHT
YES—BUT SHE PERKED UP AFTER THE VET GOT HERE LUCKY THEY COULD GET HIM RIGHT AWAY BY 'PHONE
THAT FELLOW WHO PASSED OUT THE JUICY WORMS HASN'T BEEN AROUND THIS YEAR, HAS HE?
NO, I UNDERSTAND HE'S BUSY WITH ODD JOBS NOW THAT HE HAS A TELEPHONE
MR. McGREGOR'S ACCIDENT YESTERDAY PROVED THAT IT'S A GOOD THING TO HAVE A TELEPHONE HANDY
CERTAINLY DID. THE DOCTOR GOT HERE IN A HURRY
THAT BARN FIRE LAST NIGHT HAD ME WORRIED. GLAD THE POND WAS HANDY
I'M GLAD THE TELEPHONE WAS HANDY. THEY GOT HELP JUST IN TIME TO SAVE THE HOUSE
THEY'VE SURE PILED THE HAY INTO THIS BARN TODAY!
I'LL SAY SO! THEY USED THE TELEPHONE TO GET EXTRA HELP FROM THE NEIGHBORS

These two birds are cawing as if they were the first to discover how much a telephone can help, especially during the busy season.

The busiest days of Spring are just ahead. Then, more than ever, you'll need a telephone . . . to round up extra help for the big jobs, to arrange to share work with neighbors, to save time, when there are so many things to do and all too little time to do them. Why worry through another season without this big help?

NEW YORK TELEPHONE COMPANY

*A Farm Telephone Costs Only 4¢ to 10¢ a Day. Ask Our Business Office for the Exact Rate in Your Locality*

These boys are certainly not barking up the wrong tree. A telephone is a real help when sudden illness strikes a herd.

Expert assistance in caring for sick livestock is quickly obtained, if you have a telephone. There's no time wasted in going for the veterinarian; and as soon as you have him on the telephone, you can get first aid information. With a telephone on the farm, there's less of a risk of losing a valuable farm animal through illness or injury.

NEW YORK TELEPHONE COMPANY

*A Farm Telephone Costs Only 4¢ to 10¢ a Day. Ask Our Business Office for the Exact Rate in Your Locality*

GOT BELLS STUFFED EXHIBIT—NEW YORK WORLD'S FAIR

The reasons for having a telephone are as clear as the water of a trout brook.

People who have odd jobs to be done are pretty sure to call first on the man who has a telephone. In this way they can quickly talk over the work, easily keep in touch with you to shift plans or to check on how the job is going. If you're looking for extra work, a telephone in the house is a real help.

NEW YORK TELEPHONE COMPANY

*A Farm Telephone Costs Only 4¢ to 10¢ a Day. Ask Our Business Office for the Exact Rate in Your Locality*

It's easy to see that these are not "dumb bunnies." A telephone saves precious minutes in getting the doctor when there's an accident or sudden illness on the farm. It places the family in instant touch with someone who can help; for by telephone you can get first aid instructions at home to make use of them. Should there be an emergency, having a telephone means greater protection for you and yours.

NEW YORK TELEPHONE COMPANY

*A Farm Telephone Costs Only 4¢ to 10¢ a Day. Ask Our Business Office for the Exact Rate in Your Locality*

Being a "goose" isn't stupid in this case. For they're right!

Having a telephone handy is a great advantage in fighting a fire. It helps to bring neighbors or the fire department on the run. And early help in fighting a fire often means being able to prevent its spread to other buildings on the farm. Your investment in farm property needs the protection of a telephone.

NEW YORK TELEPHONE COMPANY

*A Farm Telephone Costs Only 4¢ to 10¢ a Day. Ask Our Business Office for the Exact Rate in Your Locality*

It's certainly a "bird of an idea" to get the help of the telephone during the busy season.

A telephone saves you time and trouble when there's lots to do. Without leaving the house you can arrange with neighbors to share work, order needed supplies from town . . . and for all practical purposes, be in two places at once. Yet running errands is only one of the many ways a telephone can help you and your family.

NEW YORK TELEPHONE COMPANY

*A Farm Telephone Costs Only 4¢ to 10¢ a Day. Ask Our Business Office for the Exact Rate in Your Locality*

AFTER THAT BREAKDOWN I DIDN'T THINK THEY'D GET THIS FAR WITH THE MOWING TODAY
THEY TELEPHONED TO TOWN FOR A NEW PART, AND IT CAME RIGHT OUT ON THE BUS
—I UNDERSTAND YOUR GRAND DAUGHTER WAS PRETTY SICK LAST NIGHT
YES SIR, IT WAS "TOUCH AND GO"—UNTIL THEY GOT THE "VET" BY PHONE
LUCKY THEY HAD A 'PHONE IN THE HOUSE WHEN YOUNG JIMMIE FELL OUT OF THE APPLE TREE
YES - DOC BROWN WAS ABLE TO TELL THEM WHAT TO DO UNTIL HE GOT HERE
MR. PERKINS IS SO BUSY THESE DAYS YOU'D THINK HE WAS GATHERING HONEY
HE'S BEEN GETTING MORE ODD JOBS SINCE HE HAD THAT TELEPHONE PUT IN
THEY MADE QUICK WORK OF THAT FIRE IN THE BARN LAST NIGHT
THE FIRE ENGINE CAME ON THE HOP WHEN THEY GOT WORD BY TELEPHONE
THOUGHT WE'D GET A DAY'S REST, BUT THEY'VE GOT THAT CUTTER FIXED ALREADY
YES, THEY PHONED TO TOWN FOR A BLADE, AND HAD IT SENT RIGHT OUT

Even a grasshopper mind can concentrate on the importance of having a telephone during the busy season.

When machinery breaks down, it sure is a help to have a telephone. You, and those working with you, lose less time off the job if you can telephone to town for a needed part or expert assistance. Running errands is one of the telephone's regular jobs on the farm—a doubly valuable help when you're extra busy.

NEW YORK TELEPHONE COMPANY

*A Farm Telephone Costs Only 4¢ to 10¢ a Day. Ask Our Business Office for the Exact Rate in Your Locality*

This is no ordinary cock and bull story—it's the real bull. A telephone is a protection to livestock.

There's no wondering what to do when a valuable cow or horse is hurt or taken suddenly ill—if there's a telephone handy. In almost no time you can call the veterinarian, get first aid advice until he arrives. Your investment in livestock needs the protection of a telephone.

NEW YORK TELEPHONE COMPANY

*A Farm Telephone Costs Only 4¢ to 10¢ a Day. Ask Our Business Office for the Exact Rate in Your Locality*

There's real meat in this reason for having a farm telephone—it's a valuable protection to you and your family.

Accidents and sudden illness give no warning. If they should happen, a telephone call can bring you help in a hurry. By telephone the doctor can give you first aid advice, and, after his visit, keep in touch with you as needed. You're better prepared to cope with accident or illness when you have a telephone.

NEW YORK TELEPHONE COMPANY

*A Farm Telephone Costs Only 4¢ to 10¢ a Day. Ask Our Business Office for the Exact Rate in Your Locality*

If you're looking for odd jobs, a telephone may not keep you as "busy as a bee." But it can help you get more work.

When you have a telephone, people who want you to work can get in touch with you easily and quickly. They can make and change arrangements for doing the job—without wasting your time or theirs. No doubt about it, you stand a better chance of getting and keeping work if you have a telephone.

NEW YORK TELEPHONE COMPANY

*A Farm Telephone Costs Only 4¢ to 10¢ a Day. Ask Our Business Office for the Exact Rate in Your Locality*

These boys have "baled up" one good reason for a farm telephone—it's a real protection in case of fire.

When fire threatens you can get help in a hurry from the neighbors or the fire department—if you have a telephone. Most fires have small beginnings, and getting help in a hurry often means the difference between losing and saving valuable property. The first step in fighting fire is to have a telephone in the house.

NEW YORK TELEPHONE COMPANY

*A Farm Telephone Costs Only 4¢ to 10¢ a Day. Ask Our Business Office for the Exact Rate in Your Locality*

The horse laugh is on these fellows; machinery breakdowns don't amount to much when there's a telephone on the farm.

A breakdown during the busy harvest season won't waste nearly so much of your time and the time of those working with you, when you can telephone at once to get help or spare parts; in no time at all you can have the machine back at work. You're really not ready for the busy season just ahead unless you have a telephone.

NEW YORK TELEPHONE COMPANY

*A Farm Telephone Costs Only 4¢ to 10¢ a Day. Ask Our Business Office for the Exact Rate in Your Locality*

Reproductions of some of newspaper ads being run in rural areas of upstate New York. These cartoon ads feature "speaking" farm animals; below, in small type, are printed a few sentences tying-in the cartoons with telephone service, followed by the name of the New York Telephone Co. and a selling "plug." "You are 'ringing the bell' with that kind of copy" wrote in one newspaper editor to the telephone company.

***THOROUGH INSPECTION** and overhaul of entire line at least twice each year clears trouble before it happens. Conditions thus found and cleared comprise*

# *Little Things In*

# *Rural Line Transmission*

By RAY BLAIN

THE VALUE of any telephone service depends entirely upon the ability of one subscriber to converse with another, in comfort at all times. Comfort in a telephone conversation means talking in a natural tone of voice without yelling or shouting. This was not always possible in the old days, but in recent years the "Whoop & Holler Telephone Co. Inc." has definitely gone out of business.

There is no reasonable excuse for poor telephone service at the present time if a company will only take advantage of modern materials, tools and equipment, all of which may be obtained at a reasonable cost. In this article an attempt will be made to indicate a few simple rules which it is believed all progressive telephone companies should consider. Actually there is no excuse for even the smallest telephone companies not giving good service as they form an important link in our modern universal telephone system.

We shall first consider some elementary theory of telephone transmission. When one talks into an ordinary telephone, the sound waves produced by the voice strike the diaphragm of the transmitter. In so doing the mechanical energy is converted into electrical. A telephone line is designed to transmit as much of this energy as possible from one telephone to another, regardless of the distance they may be separated.

When the sound received at the distant end of the line is much lower in volume than the original speaking voice, it is quite evident that some of the energy must have been lost in transmission. This is known as "transmission loss." It is made up of all the accumulated losses in the individual parts of the complete circuit.

Outside of a few exceptions, such as amplifiers, each piece of equipment introduced into the circuit causes some transmission loss; in addition, there is the loss in the line itself, which increases with its length. The loss in the line is called the attenuation loss or attenuation of the line.

Should one telephone be connected directly to another the sound received will be slightly louder than the original voice spoken into the transmitter, since the transmitter itself is somewhat of an amplifying device. The alternating current generated by the transmitter flows directly to the other telephone without anything between to impede or shunt out any part of it. If, however, 20 miles of No. 19 gauge cable is inserted between the two instruments, the sound reproduced by the receiver will be much lower than that picked-up by the transmitter at the sending end.

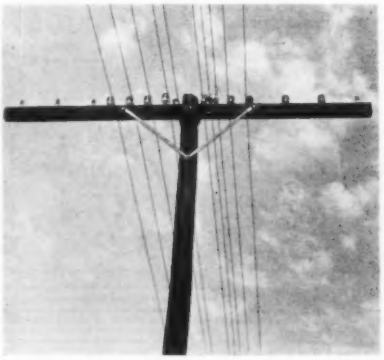
Every telephone line of any length contains certain properties or characteristics which affect the transmission of the weak alternating voice currents. These consist of resistance of the conductors and a small amount of inductance which causes some inductive reactance. Also, there is a distributed shunt capacity between the wires of a circuit and other nearby circuits and ground.

Likewise all circuits have a certain escape of current or leakage. These leaks increase as the insulation is lowered. This loss or leakage is ordinarily very low on cable circuits but on some open-wire lines it may be exceptionally high, especially in wet weather. Ordinarily, attenuation may be known as the progressive loss along a line due to the combined effect of resistance, inductance, capacity and leakage.

Although apparently contrary to the general belief of many, a rural line cannot be expected to last forever; and neither can it be expected to give good telephone service unless it is well-maintained. When a pole rots off it should be replaced or reset immediately before it causes an interruption of service. Rusty wire and defective joints should be re-

Proper line clearance can be provided by→ trimming trees around the wires; service can be no better than the line's wet-weather insulation.

Wires bunched on a crossarm avoid excessive tree trimming.



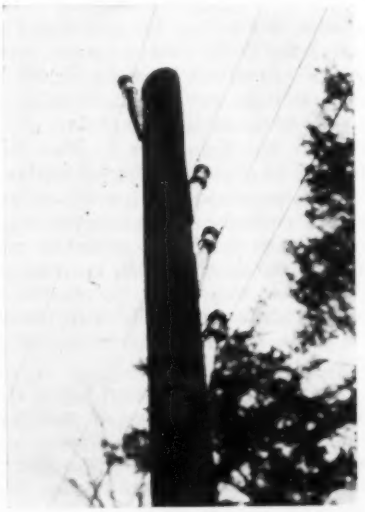
placed, for they are frequently the cause of increased resistance in the line and, consequently, of large transmission losses.

When trees touch the line they should be trimmed, as they cause low insulation and serious leakage. Cracked, broken, or missing insulators should be promptly replaced, for they also represent transmission losses, especially in wet weather. The importance of a line giving good service during inclement weather is stressed due to the fact that the service can never be any better than its wet weather insulation.

Any telephone service, to be of lasting value, must likewise be dependable. Should a rural line fail and be out of service even a single hour, the probabilities are that someone during that time would find himself in urgent need of rapid communication. Urgent need refers to such cases as the house or barn catching on fire, serious accidents or sickness, which demand the immediate services of a doctor.

The isolated location of the majority of rural line telephones undoubtedly increases their general importance. Rural line telephone service is certainly even more important than the average city service; and observation of proper construction and maintenance methods can make it just as dependable and at a cost well within the reach of any telephone company.

It is a proved fact that rural lines can be maintained in a manner as to make the service dependable and line failures few and far between.



The running of more than two metallic circuits on a bracket pole line is not recommended ordinarily; if such runs cannot be avoided, the wires should be separated at least 12 inches in all directions.

This can be best accomplished by a thorough inspection and overhaul of the entire line at least twice each year.

This form of preventive maintenance actually clears trouble before it happens by the elimination of conditions which, if neglected, would eventually cause serious trouble. It is surprising how little these semi-annual overhauls cost, and they actually prove cheaper than frequent trouble trips with corresponding service interruptions.

While these periodic overhauls may be conducted in a number of different ways, the following method has been used with complete success and, therefore, can be recommended for consideration of others. If the line wire is slack or uneven, or parts rusty and in need of replacement, it is untied at all poles for a considerable distance, between two corners if possible. The wire is left laying loose on the brackets or crossarms.

Then the corners are thoroughly inspected to make certain they are satisfactory. Corner poles, anchors and guys are replaced when necessary. The corner poles must be well raked—that is, leaned into the strain—and the anchors and guys solid and strong. Patent type anchors can now be purchased at a small cost; they are easy to use and hold the load.

Going along the line, each pole is rocked with a pike pole in an effort to break it off at the ground level. Many poles found defective may be reset as short poles ordinarily are not detrimental in a rural line, except at road crossings. All good poles are straightened, tamped well and then banked by piling dirt around their bases.

Next, all defective or rusty wire is cut out and the wire is then pulled until it is level and of the proper tension. High-resistance splices are cut out, and this generally improves transmission more than any other single operation. All defective insulators are replaced and the wire tied-in properly. This completes the overhaul on that particular section of the line.

Naturally work of this extent will not be necessary on each successive overhaul; only on such lines as have been neglected for an extended period. When a line is once placed in this first class condition, very little work will be necessary on each periodic overhaul. However, removing the few defects which are found on even a good line will be well worth the effort, for this will be the means of preventing numerous cases of trouble later.

A bracket circuit with wires well tied-in on the insulators.

Recent extensive rural electrification has forced the changing of many rural grounded lines to metallic circuits by adding a second wire. The old wire is generally rusty and of higher resistance than the new, and this results in an unbalanced condition and noise trouble. About the only remedy for this is to string two new wires.

It is true that the joints in the old wire may be cut out and new ones made with sleeve connectors. Thus the resistance of the old wire, if it is not rusty, is reduced so that it may balance with that of the new wire. It is, however, doubtful that after this is done, any material saving has been made.

Foreign noise of any kind on a line is always detrimental to good telephone transmission. Inductive interference is also frequently responsible for low transmission on a telephone line when it parallels a power line for a considerable distance. This type of trouble must often receive special treatment but ordinarily it can be overcome by balancing, through the installation of properly-spaced transpositions.

Special transposition systems can be used but ordinarily a line can be cleared by transposing the circuit directly at its center or at the center of the parallel. When this does not provide a satisfactory balance, two other transpositions can be cut in the line, which quarters it. When this does not correct the fault, four additional transpositions may be installed to separate the line into eights. This is an admitted unscientific process but, strange to say, it generally gets the job done.

Good glass insulators can now be

procured at a most reasonable cost and their use is recommended on all lines. Too often rural lines are supported on small porcelain knobs, which do not provide adequate wet-weather insulation for bare line wires. These porcelain knobs are, however, satisfactory and can be used to advantage in the support of insulated drop wire on poles or buildings.

Rural lines are generally supported on four-pin or six-pin crossarms or on wood brackets. When wood brackets are used the wires should be separated at least 12 inches in all directions, as closer spacing may result in transmission losses. Ordinarily, the placing of more than two metallic circuits on wood brackets on a pole line is not recommended, although occasionally three circuits are used with apparent success.

Numerous types of good wire are now available for general rural line use. Galvanized and Copperweld steel wire are used frequently and occasionally the more expensive hard-drawn copper. The newly-developed high-tensile strength galvanized wire may be used to advantage in the long span construction.

Buried type wire which is ordinarily installed in the ground with a special plow is now in the experimental stage. It is believed that it has numerous possibilities for use in rural lines in certain localities.

Care should always be exercised in the selection of poles for rural line use. Short poles, 16 to 20 feet in length, are more convenient to work on and provide a stronger line. This length generally proves satisfactory if longer poles are used to support the line over road crossings. The class and size of poles to select will depend upon the number of wires they will be required to support. The ultimate load should be considered when selecting the poles for a certain line.

The mistake should never be made of setting poles too shallow in the ground. A 16 or 18-foot pole should always be set to a depth of at least 3½ feet, and a 20-foot pole at least four feet in the ground. Many a good pole has kicked out of the ground under a sleet load, due to the fact that it was not set to the proper depth in the first place.

The use of insulated drop wire is recommended in either twisted pair or parallel type to extend the line from the pole to the protector at the telephone. This wire can be dead-ended with suitable clamps, which is much easier than tying on knobs. The drop wire should always be run in a manner so as to clear all trees. The use of solderless connectors is preferred to soldering where the drop wire connects to the line wire. When solder is used for this purpose, by inexperienced workmen, a high resistance joint generally results—and this represents a large transmission loss.

All telephones on rural lines should be equipped with an approved type of lightning protector. The protector blocks should be cleaned after a lightning storm; otherwise they may cause excessive transmission losses. The weatherproof variety suitable for outside mounting, is usually desirable, for only one pair of wires need be run into the house, and a troubleman can always get at the protector to clear trouble whether the subscriber is home or not.

When this type is not available the protector should be installed in a dry basement. However, when a protector must be installed in a room of the house, place it near the drop wire entrance and never adjacent to a lace curtain or other inflammable material.

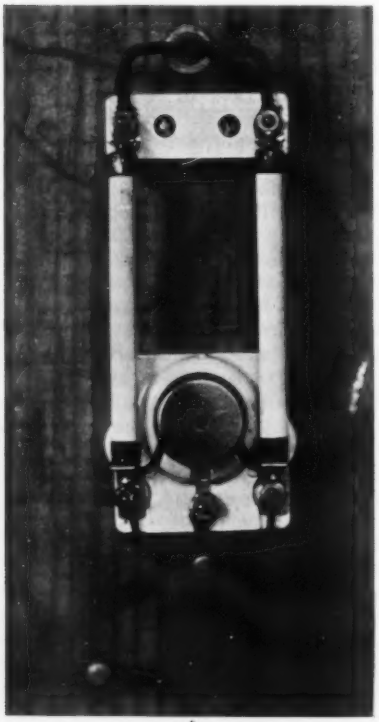
The drop wire entrance should be made through a ⅜-inch porcelain tube. A ¾-inch hole should be drilled for the tube, sloping slightly upward so that moisture will not follow the wire into the house. The tube should be wedged into the hole by a wrapping of friction tape, and the drop wire into the tube in like manner.

A ¼-inch hole without a bushing should be drilled through the wall for the ground-wire entrance. The ground connection is most important on either a metallic or a grounded line. The ground wire should be No. 14 rubber-covered, single copper wire and run with as few turns as possible from the protector to the ground rod.

The wire should be attached to the ground rod with a suitable clamp or connected to the short length of wire which ordinarily comes attached to ground rods, by a suitable splicing sleeve or solderless connector. The ground rod should be at least five feet in length; eight feet is better.

The twisted-pair house wire, which connects the protector with the telephone, should be neatly run and preferably without splices. It should be secured to the door and window frames, usually with milonite nails, and not exposed to moisture.

Abnormal transmission losses can often be traced to loose or corroded connections at the protector. All wires should be well-cleaned, placed between the washers of the binding posts on the protector and the nuts securely fastened. The ground wire should never be run through the wall in the same hole with the drop or line wire.



←On inside telephone protectors the drop wire enters through a porcelain tube at the top of the protector and a separate hole is provided for the ground wire.

Protectors mounted on outside walls of buildings should have weatherproof mounting.

Weak and rundown batteries, perhaps, cause more low transmission on rural lines than any other part of the telephone. Even the best dry cell batteries gradually wear out, regardless of how little they are used. Naturally, however, the more they are used, the shorter will be their life.

It might be said that batteries are the very heart of the telephone for, when they fail, the entire telephone ceases to function. When batteries are weak, even the best of telephones will not talk properly and other parties will not be able to hear satisfactorily. Ordinary gas-engine ignition batteries should never be used for telephone purposes as the regular telephone type batteries will give better service, cost less and last longer.

Numerous large telephone companies have experimented extensively with the routine replacement of batteries in all telephones on their system. Some replace all of them at the end of each year, 18 months or longer, depending on the type of battery used. With this method some batteries will be discarded with considerable life remaining in them, it is true; but the overall transmission on the system will be much better and the cost will actually prove less as individual battery trouble-trips will be eliminated.

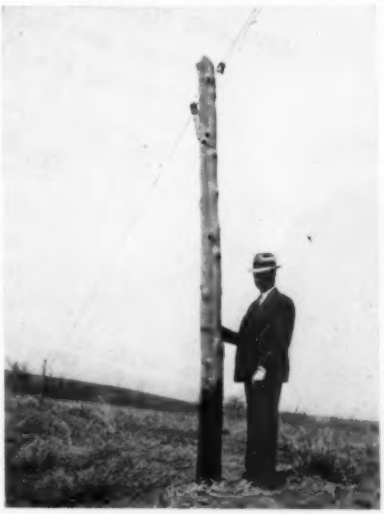
Some companies have also experimented with the idea of mailing batteries out to their subscribers when the old ones become exhausted, permitting the subscribers to make the change. This to our knowledge has not proved at all satisfactory. Care should always be exercised to make good solid connections to the cells in the telephone, and an inexperienced person cannot always be trusted to perform this task properly.

Dry cells of doubtful value should be tested with an approved type of telephone battery tester and not a cheap ammeter. A telephone tester is in reality a voltmeter shunted by a resistance of 6 2/3 ohms. When connected across a dry cell, the tester indicates its output under load. If the voltage of a cell drops below 0.93 when tested in this manner, it should be immediately replaced.

Great improvement has been made during the past few years in telephone instruments of all types. This improvement is especially noted in transmitters and receivers. It is likewise true that many old and obsolete telephone instruments are still in service which should have been thrown on the junk heap years ago.

Naturally all such telephones should be replaced with the least possible delay but, unfortunately, the necessary financial arrangement cannot always be arranged. Often, however, considerable relief may be obtained by merely replacing the transmitters and receivers of the defective instruments. While this arrangement will not provide the full advantage of a new instrument, a great improvement can frequently be realized.

To sum up the question of rural line telephone maintenance in a few words, we would say that it always



Short husky poles are used with brackets on rural telephone lines.

pays to maintain constant guard in preventing conditions to remain on any line which may cause a loss in the voice currents and provide an inferior grade of transmission.

The few simple rules mentioned, if faithfully observed, will do much toward the removal of the worries and headaches from the life of anyone charged with the responsibility of maintaining one or more important rural lines.

▼ ▼

## Michigan Bell Improving Rural Telephone Service

Rural and small community residents of Michigan were recently given an inventory of telephone service improvements which probably revealed the most far-reaching program of the kind in the 61-year history of the Michigan Bell Telephone Co. Every section of the company's territory is affected by the program, which is planned to continue unabated next year.

President George M. Welch of the Michigan Bell company has announced that the rural expansion program of the company, started in 1937, will produce the following results by the end of this year:

Additions of more than $1,250,000 to the company's rural and small community plant; the erection of 68 new company-owned and leased buildings; 49 per cent of the small exchanges will have been converted from magneto to common battery operation; a reduction of about 50 per cent in the maximum number of customers per rural line, and, a consequent improvement in rural and small community service.

This service expansion has been accompanied, President Welch emphasized, by a residence rate schedule that is 15 per cent below that of 1934 as the result of two rate reductions since that year.

"With these expanded facilities also has come a substantial improvement in service," Mr. Welch declared. "It is easier to hear over rural lines, and the all-around service is better today than ever before because of the plant improvements made the past three years. Pole lines and other outside equipment are being replaced. More and more cable is being extended into rural areas, further safeguarding the service. Modern telephone instruments and central office equipment are being installed."

By the end of December, he stated, gross additions to central office equipment in rural areas during the last three years will have reached $525,000, outside plant additions, $474,000, and new telephone instruments, $251,000, or a total of $1,250,000.

▼ ▼

## FARM ANIMALS TALK IN ADS

*(Concluded from page 29)*

moved away; and the transposition sentence between the cartoon and the real message in the copy says: "Even a cat and a dog can agree as to the value of a telephone in this home. . . ." Two very fat pigs tell how the telephone helped when young Jimmie fell out of the apple tree. The message is introduced with: "There's real meat in this reason for having a farm telephone."

While these advertisements are primarily "new service" ads, the company feels that there is a "by-product" of toll promotion inasmuch as each insertion tells of the uses to which the farm telephone may be put.

The advertisements are producing good results. That is the feeling of the men in the field who have talked with the sales people and who have also had comments from editors of rural newspapers.

# MEETING WITH UA

HIGHLAND TELEPHONE COMPANY
145 NORTH MAIN STREET
MONROE, N. Y.

TELEPHONE
D-AL 2141

FRED S. FLORANCE
ASSISTANT GENERAL MANAGER

October 3, 1939

Mr. J. S. Murray, Division Sales Manager
American Automatic Electric Sales Company
1033 West Van Buren Street
Chicago, Illinois

Dear Mr. Murray:

We were very pleased to see the recent announcement of the type 50 monophone as a companion to the type 40.

Since we purchased our first type 40 monophones last spring, they have met with the unanimous approval of those subscribers who have used them. The features that are recognized first are the pleasant tone of the bells and the improved appearance. After they have used this instrument, however, they tell us they like the quiet dial and the improved transmission.

While we thought the 34A3 monophone was excellent, we feel that the type 40 is far superior and will, in the future, order only this type.

Very truly yours,

F. S. Florance

FSF:CLJ

# UNANIMOUS APPROVAL

## Operating Companies Everywhere Agree That They Are the Finest Monophones Ever Built!

The Type 40 Desk Monophone, and its wall-mounting companion, the Type 50, are without doubt the finest telephones we have ever built. We are proud of them because our designers have achieved exactly what they set out to do —to make two outstanding telephones that would look better, wear longer, please subscribers more and talk up better than any other instrument offered before. How well they have succeeded is evidenced by reports—similar to the one shown here—from operating companies everywhere.

There are many reasons for this success. We could tell you about the new high fidelity transmitter, with response curves which surpass anything so far produced—about the new damped receiver which provides highest fidelity with low sidetone characteristics—about the new circuit which coordinates transmission characteristics for best results on long and short lines — about the new two-tone ringer, which provides a pleasing signal of great penetrating power.

But the telephones themselves can tell you so much better! Why not try them? Order samples today, and you'll know why we say they are the finest telephones we have ever built.

**AUTOMATIC ELECTRIC**

MAKERS OF TELEPHONE, SIGNALING AND COMMUNICATION APPARATUS
ELECTRICAL ENGINEERS, DESIGNERS AND CONSULTANTS

Distributors in U. S. and Possessions:
AMERICAN AUTOMATIC ELECTRIC SALES COMPANY, 1033 W. Van Buren St., Chicago, U. S. A.
Export Distributors: AUTOMATIC ELECTRIC SALES COMPANY, LIMITED

*IF ENTIRE PLANT personnel acquires the continuous inspection habit, service failures cannot easily occur. Good testing equipment—properly used and taken care of—comprises one of the principal elements of*

# Practical Plant Maintenance

By RICHARD DAVIS

PREVENTIVE maintenance is the practice of maintaining the plant in such a manner that service failures cannot easily occur. Simple isn't it? It is almost as simple as it sounds when it has become a habit of every telephone employe—from the plant superintendent down to the janitor—to look for weak spots in the plant and to see that they are promptly repaired or replaced.

To successfully carry out a program of preventive maintenance the entire plant personnel must necessarily acquire this habit of continuous inspection in order that no defective plant equipment shall remain in service until its ultimate failure.

When the troubleman receives an assignment, such as "bells do not ring," it is not enough that he adjust or replace the ringer; he should completely inspect the line, drop, housewiring and subscriber's set for defective wire, cords, transmitter, receiver, bad connections and loose parts. He should be taught to locate these future service failures and to immediately return the defective plant to good condition; or, if that is not possible, to immediately report the defect to his testman or wire chief before leaving the subscriber's premises.

The wire chief or testman will make a ticket covering the reported defect and will see that it is properly repaired as soon as possible. The testman can do his bit by testing a certain number of lines each morning, say 25 daily, until he has tested all of the working lines.

If the lines are wet from rain or heavy dew that is all the better, because then he can locate many cases of low insulation which would very likely test O.K. on a dry day. In this way every line can be tested; and it is sure to be tested whether it has been reported "out of order" or not, as often as local conditions warrant.

The central office maintenance force should likewise be on the alert. One of the best places to head off "Old Man Trouble" is on the lowly main frame. Because of its simplicity it is often neglected, and it is surprising how many unsoldered jumpers and burned or dirty carbons one will find on the average frame.

The switchboard cords should be regularly inspected and polished, gauged and tested for cutouts and noise. The same treatment also applies to the jacks and keys.

A very good method of testing for cutouts or fading is to feed the alternating output of an audio-oscillator into the suspected equipment, listening to the tone with a head receiver as it comes through the equipment. By shaking and twisting the cord, operating keys, etc., the trouble may be located. If a cutout is present, its exact location may be found by using a test prod attached to the receiver. If the tone is adjusted to a low volume level, the ear will be more sensitive to changes. A tone of approximately 1,000 C.P.S. is most pleasing.

All central office equipment should be tested for loss with a regular transmission measuring set at least once a year. Repeating coils should be checked to make sure the coils are not reversed, as a reversed coil can cause a loss of from 3 to 4 db. This transmission test or its equivalent should be carried out through the entire plant if possible.

A good substitute for a regular transmission test is the consistent use of a 20 db pad inserted in the circuit at the testboard or in a special cord on the switchboard in very small plants. If satisfactory conversation can be carried on between the testman or operator and the troubleman, the transmission equivalent is good. This method will give consistent results only if both parties talk with the same volume and from about the same distance from the transmitter each time.

No program of preventive maintenance can be successful unless an adequate supply of material and repair parts is kept in stock. There is nothing that can be quite so disheartening and so discouraging to a maintenance force as the fact that they have no material with which to repair weak plant. The management will soon find that the preventive maintenance forces have become just ordinary "trouble-shooters" if it allows such a condition to exist.

Another important part of the program is good test equipment, properly used and taken care of, since a great number of faults can only be located with the use of test instruments. Good, clean-looking test equipment makes the maintenance force feel proud of their positions and gives them an air of confidence that is reflected in public goodwill.

And one day—when the program has had its effect on the service—the boys can stay by the fire on cold, wet days instead of working all day and night to clear trouble no one could find until after it had happened.

If good old John Q. Public's service never fails, his telephone will never come out. Simple isn't it!

## NOW IS THE TIME TO ENJOY LIFE

**If we are ever to enjoy life, now is the time—not tomorrow, nor next year, nor in some future life after we have died.**

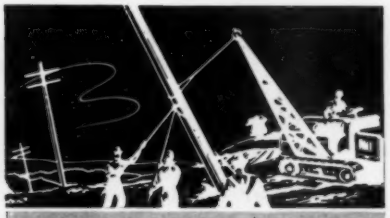
**The best preparation for a better life next year is a full, complete, harmonious, joyous life this year. Our beliefs in a rich future life are of little importance unless we coin them into a rich present life. Today should always be our most wonderful day.**—THOMAS DREIER.

# WHY IT WILL PAY YOU TO USE Amertel

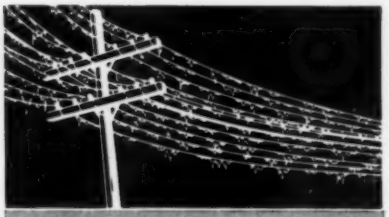
HERE are two new telephone wires, ***Amertel-85*** and ***Amertel-135.*** The illustrations shown here with explanatory captions quickly demonstrate the outstanding improvements that are embodied in these new wires. From now on it will pay you to remember the name ***Amertel*** and to use it whenever you place an order for telephone wire. We will be glad to supply you with complete technical data on ***Amertel-85*** and ***Amertel-135.***

***Amertel*** is also available in the regular grades "EBB"—"BB" and "Steel."

***Amertel*** **lowers maintenance costs**



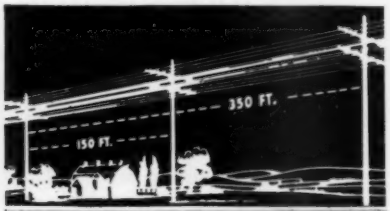
***Amertel*** **lowers construction costs**



***Amertel*** **has greater safety factor—withstands heavier ice and wind loads**

***Amertel*** **offers added strength**
**(Minimum breaking strength—No. 12 B.W.G.)**

| | |
|---|---|
| Amertel-135 grade | 1213 lbs. |
| Amertel-85 grade | 793 lbs. |
| Amertel B.B. grade | 476 lbs. |




***Amertel*** **makes longer spans possible**

| | |
|---|---|
| Amertel-135 grade | 350 ft. |
| Amertel-85 grade | 225 ft. |
| Amertel B.B. grade | 150 ft. |

***Amertel*** **has increased transmission efficiency at voice-frequency.**

## AMERICAN STEEL & WIRE COMPANY

Cleveland, Chicago and New York

Columbia Steel Company, San Francisco, *Pacific Coast Distributors* • United States Steel Products Company, New York, *Export Distributors*

UNITED STATES STEEL

# The Operators' Corner

By MAYME WORKMAN

Traffic Supervisor, The Illinois Telephone Association, Springfield, Ill.

***HOW to handle changes in classification of long distance calls. Series No. 386***

CONDITIONS which occur in connection with handling long distance calls, in some cases, result in a change of classification of the call. For example, on a station-to-station collect call, if the person answering will not accept the charge and the calling party volunteers the name of someone at the called station who will accept the charge, the operator should explain that if she tries to reach this person, the charge will be the same as that for a call to a particular person.

If he agrees to this, the operator will say to the called station, for example, "The (calling party) says that Mr. (specified party) will accept the charge which will be the same as that for a call to a particular person." The operator will be guided, thereafter, by the answer of the party at the called station.

Whenever the classification of a call changes, it is the operator's responsibility to so advise the calling party and the called station if it is a collect call.

On a collect station-to-station call, if the called station will accept the charge at a later time—for example, at 7:00 p.m., if no one is there who can accept the charge, *or if the acceptance of the charge has not been secured at the end of the time allowance for holding the toll circuit*—the call is considered as equivalent to one on which the called station refuses to accept the charge.

On a station-to-station collect call, when announcing the call on a subsequent attempt or on receipt of a WH party report, the operator will say: "I have a collect call for anyone from Mr. (calling party) at (calling place). The charge will be the same as that for a call to a particular person. Will you accept the charge?"

When an operator advises the called station that the charge on the call will be the same as that for a call to a particular person, if the called station asks why he will be charged at the person-to-person rate the operator will explain that the *equivalent to person-to-person service has been given.*

***Questions from Illinois Operators***

1. What phrase is used if the called number on a station-to-station collect call takes longer than three minutes to accept the charge? How do you explain that it will be person-to-person?
2. When a ticket is covered by an incoming call, what should you write on the ticket?
3. When do you use the phrase, "I will give you Information?"
4. Should an entry like "AG 9-12-39" appearing in the "Special Instruction" space be encircled in green? Or shouldn't it appear on the face of the ticket?
5. When should a ticket be canceled after being held over from a previous day if you haven't been told to try it again?

*The answers to these traffic questions may be found on page 57.*

## Automatic Dial Service for Prosperous Nebraska Area

Otto Fuerst, general manager of the Platte Valley Telephone Corp., Scottsbluff, Neb., has announced that automatic dial stations will be installed during the next six weeks in exchanges at LaGrange, Wyo., and at Bayard and Minatare, Neb.

The company is expending $30,000 in rebuilding and extending its lines in the sugar beet area which has had the lion's share of Nebraska farm prosperity the last three years. Gering will have dial service before spring, and the entire valley will have dial service within the next two years.

## INDEPENDENT PIONEER ASSOCIATION OFFERS NATIONAL CONVENTION TRIPS

**THE INDEPENDENT Pioneer Telephone Association is sponsoring a special membership campaign to end just before the annual convention of the Independent telephone industry next fall. The reward to Independent Pioneers bringing into the association specified numbers of members will be a trip to the national convention; that is, transportation, hotel room and meals will be paid by the Independent Pioneer association.**

**The campaign was authorized by the association's executive committee last month and is announced by Secretary-Treasurer J. K. Johnston. The conditions under which awards will be made provide that these trips to the national convention shall be given to Independent Pioneers, who during the period between the 1939 and the 1940 convention dates shall obtain a specified number of new applications for membership in the Independent Pioneer association accompanied by advance payments. The applications necessary to obtain the trips have been classified as follows, according to the residence of the contestants:**

**Those residing within 1,000 miles of Chicago, a minimum of 25 applicants.**

**Those residing more than 1,000 miles from Chicago and less than 1,200 miles, a minimum of 30 applications.**

**Those residing more than 1,200 miles from Chicago and less than 2,500 miles, a minimum of 50 applications.**

**The contest is limited to Independent Pioneers working in an individual capacity and excludes company executives who desire to show special cooperation with the Independent Pioneer association by making block applications for groups of eligible employes.**

**Secretary-Treasurer J. K. Johnston, 632 Lemcke Building, Indianapolis, Ind., will supply information, application blanks, advertising slips, etc., to all Independent Pioneers interested in entering this contest.**

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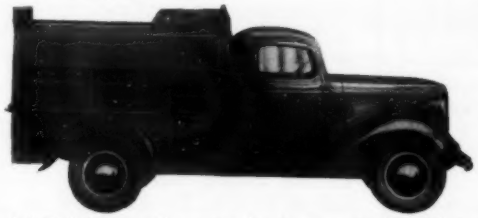

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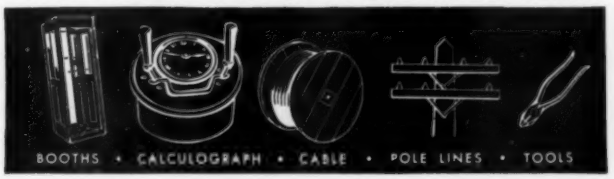


*A RECEIVER-BATTERY test set that provides a means for making a number of simple tests of lines, equipment and apparatus is described in this article on a*

# Simple Circuit for Testing in Small Exchanges

By FRANK L. WHITAKER

NO MATTER how scientific we telephone managers become, there will always be the beginner-troubleman looking with bewilderment and interest upon the many gadgets and whangdoodles with which we diagnose and locate trouble. Always try and give this new man a break, but do not overdo it and spoil him.

Start him right—which is always at the bottom. Think of the new troubleman as a small boy beginning to learn his ABC's. Teach him the full value of A first, then go on to B. Teach him the importance of knowing how to use the simplest of test circuits and to learn to fully appreciate their value.

A good beginning along the line of simple testing is the receiver-battery test set: head receiver in series with battery and two test leads. What can be done with this combination?

1. Test cables for shorts, grounds and opens.

2. Check switchboard jack and key-spring contacts for high and low-resistance tension.

3. Inspect receiver and plug cord conductors for continuity or weakness.

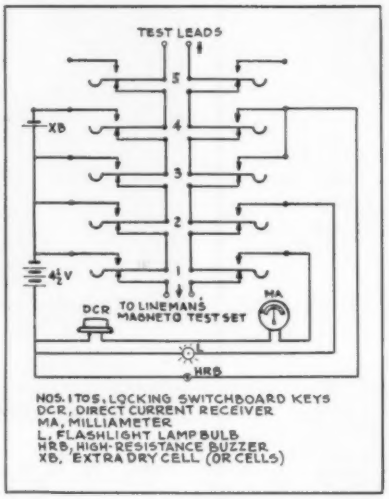
4. Locate shorts, grounds and opens in telephones, switchboards, motors, etc.

5. Check by comparison, transmitter sensitivity, etc.

6. Test night-bell contacts, drop coils for opens, grounds, etc.; kick-down drops for sensitivity. Check ringer armature adjustment in connection with reversing switch.

Other tests can be suggested but the foregoing will suffice.

For this type of test circuit a direct-current receiver must be selected. This receiver has no permanent magnet, depending on the strength of the battery for sensitivity. The resistance of the energizing coil should be in the neighborhood of 40 ohms.




Circuit of simple type of test set with which many tests may be made in the small telephone exchange.

After considerable experience with this circuit, a milliammeter may be added in series with it, and thus trouble tests may be visualized in the movement of the needle on the scale. The milliammeter is a valuable addition and will help the troubleman to cover a wide range of simple testing. With receiver resistance of 40 to 60 ohms, the meter scale should be 0 to 150. With the addition of this delicate instrument to the circuit, current consumption is very low and the testing cells will last for many months, even when used repeatedly.

In the accompanying circuit of a test set of this type, Key No. 1 may be used for comparative transmission volume tests. These tests can be made on both common and local battery transmitters in addition to symptom observations of early trouble in the service of either type of instrument.

Three flashlight batteries may be used to make the test set lighter for general use, although it will be found more desirable to arrange the wiring, etc., in a suitable cabinet large enough to hold at least six regular size dry cells and additional room for extra keys or equipment which may be added later. Care should be taken that no cast-off switchboard keys go into the set, for they may have some chronic trouble in them.

The milliammeter should be of standard type with a long scale. The best meters are very rugged and will stand a lot of hard service. The best is not expensive, and a cheap instrument is liable to cause a new man to become disgusted.

The purpose of the keys or cams in the set is to switch from one circuit to another without loss of time. A spare key or two should be added to take care of other test circuits which later may be found desirable, such as direct resistance-reading voltmeter, etc.

Key No. 2 locks into position, connecting 4½ volts in series with the test leads and small flashlight bulb or lamp. This circuit is used as a quick test for determining the presence of a short-circuit, in line, instrument, etc. It can be used as an emergency flashlight or as a "double" for the head receiver when it has been injured due to a hard fall. Very short runs of cable can be tested with the lamp, and even longer ones by the addition of extra cells. The circuit is also useful for the quick testing of fuses.

Key No. 3 puts the test leads in series with the battery and high-resistance buzzer. This combination is used to indicate shorts, grounds and opens in almost anything to be found around the exchange. In the hands of an experienced man, relative distances to short-circuits in cables may be determined by the addition of additional cells. The circuit of Key No. 4 illustrates the method of switching-in additional voltage.

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**ARMSTRONG CORK COMPANY**
**INDUSTRIAL DIVISION**
Lancaster Pennsylvania

# South Carolina Independents

# Realize Service Responsibilities

***THOUGH PROBLEMS** are great for successfully managing the telephone industry, the industry's leaders have always been able to meet and conquer them. To learn more of the details of such philosophy, in combination with their desire to furnish good telephone service, members of the South Carolina Independent Telephone Association enthusiastically attended sessions of their recent annual convention*

FULLY REALIZING the responsibility of giving the public the good service it expects, and that such responsibility requires up-to-date methods of operation and modern equipment, members of the South Carolina Independent Telephone Association attended the interesting sessions of their annual convention at the Jefferson Hotel, Columbia, November 6 and 7. As the program arranged by the convention committee progressed, the latest information on legislative problems, toll operating practices and preventive maintenance was presented.

All officers were reelected as follows: President, F. S. Barnes, vice-president, Rock Hill Telephone Co., Rock Hill; vice-president, L. E. Winget, general manager, Southern Continental Telephone Co., Inc., Sumter; secretary, H. L. Draper, Sumter, and treasurer, T. C. Thomasson, secretary-treasurer, Lancaster Telephone Co., Lancaster.

Directors elected for three-year terms are: L. E. Winget, Sumter; C. B. Barksdale, executive vice-president, Greenwood Telephone Co., Greenwood, and S. A. George, manager, Citizens Telephone Co., Lexington.

The first session was called to order Monday afternoon, November 6, by President F. S. Barnes of Rock Hill. Mr. Barnes said that he had been present at all annual conventions of the South Carolina association. He declared the attendance and the enthusiasm of this convention excelled any he had heretofore witnessed. He stated that the growth of the state association has been rapid and has reached such strength that its existence is assured.

Mr. Barnes reviewed the problems of the past year, including taxes, wages and hours and other legislation and stressed the fact that although problems were great, they were no greater than the telephone personnel and that telephone men have always been able to meet problems and always will.

F. S. BARNES, president of the South Carolina association and vice-president of the Rock Hill Telephone Co., in his annual address discussed the two philosophies of jobs and their application to the telephone industry.

### *Two Philosophies with Respect to Jobs*

"There are in America today two philosophies with respect to jobs," said Mr. Barnes. "One philosophy is that a person has a job because there is work to be done. From this it naturally follows that the person who has this job is the person who will do the work and do it well.

"To the question how much shall the pay be? The answer is: Pay shall be in accordance with the value of the work that is performed. That is the philosophy which has made America great. That is the philosophy which places the right person in the right position and which has built a standard of living in this country that is higher than that in any other country.

The other philosophy is that the purpose of a job is to support someone; and from this it naturally follows that the person to hold this job is the person to be supported. The answer to the question, What shall the pay be? is the need of the person to be supported.

It is the following of this last philosophy which has brought about much of the burdensome and unworkable legislation of the past years. There is nothing in this philosophy which will support the production of this country or maintain our standard of living.

All of us are alike, in that we spend our money and work for the things which we want. It is the desire upon the part of others for goods that we produce which makes these goods valuable. No amount of legislation will make these people want things they do not desire, or create value in undesirable goods.

The safety of the telephone industry and those working in it does not lie in legislation that makes it more difficult to render the service, nor in burdensome taxation which deprives the industry of its resources for improvement. The safety of the telephone industry and the safety and livelihood of everyone dependent upon that industry lie in the improving of the service rendered and in maintaining and increasing the desire on the part of the public for this service."

### *Reports of Officers Show Association's Stability*

Secretary H. L. Draper of Sumter reported there were 165 registered, the highest attendance of any previous South Carolina convention. He reported that there are 70,400 telephones in the state, of which 16,200 are Independently owned. Mr. Draper urged the companies to pay their dues and to participate in the

association's work. He also pointed out that companies with less than $50,000 annual gross revenue automatically become members of the national when they pay dues to the state association.

The secretary expressed his appreciation for the response he had received during the past year when he had occasion to call on the companies to help in association affairs. He told the members it is their association, the officers are elected to serve them, and members should not hesitate to contact the association for help with their problems.

Treasurer T. C. Thomasson of Lancaster, reported the association finances in satisfactory condition—20 companies having paid 1939 dues.

Louis Pitcher of Chicago, Ill., executive vice-president of the United States Independent Telephone Association, reported that 1,856 registered at the national convention held in Chicago and 66 manufacturers exhibited their equipment. From these exhibits, it was demonstrated that the Independent telephone industry did not have to go outside of its field to buy; and certainly Independents should buy *Independently.*

Mr. Pitcher stated that everything possible had been done to exempt the entire telephone industry from the Wage-Hour Law, but it was only possible to exempt operators in exchanges of less than 500 stations. There were over 10,000 bills introduced at the last Congress, of which 248 became law—the amendment to the Wage-Hour Law was one of the bills passed.

President Barnes then presented Attorney A. L. Geiger of Washington, D. C., former general counsel to the national organization. Mr. Geiger helped to organize the South Carolina association in 1934 and has attended each annual convention since.

### *Federal Regulation and Wage-Hour Law*

He spoke of the growth and interest in the association. The operating expenses of the companies, he said, would be much greater if it were not for the work of the association. In speaking of the Wage-Hour Law, he said:

"The federal government is increasing its regulatory field and taking over work formerly done by state regulatory bodies. One of these regulatory activities is the one-year-old Wage-Hour Law. This is probably only the first step in legislation of this kind. There have been sev-


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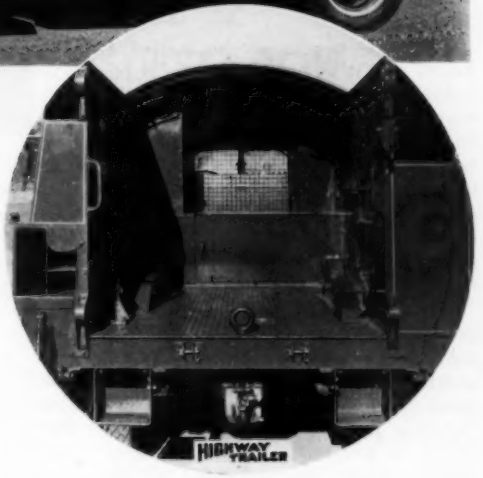


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eral rulings put out by the Wage-Hour Administrator's office but it will take litigation to finally determine certain points of the law. Litigation is slow and it will probably be a long time before the law is clear.

"The telephone companies have contended they are service establishments and not under the jurisdiction of the act. The administrator's counsel did not agree that telephone companies are service establishments, and therefore it would take litigation or an amendment to determine the status of telephone companies. The national association hoped to get a larger exemption than the one exempting telephone operators in exchanges of less than 500 stations."

Mr. Geiger urged all companies to keep records and warned that inspectors will be around and records will help in determining their status under the Act. He stated that overtime is not prohibitive—1½ times the employe's rate of pay, and not necessarily 1½ times the statutory rate of pay, must be paid for overtime.

Overtime begins at the end of 42 hours and it is not necessary to pay overtime for night work or Sunday work unless the employe works in excess of 42 hours during any one week. The amendment reads any company that "has" 500 stations. It is the opinion, although no ruling has been given out, that this means owned stations and therefore, would not include service stations.

After Mr. Geiger's address the general session divided into two groups and a traffic conference and a plant conference were held. L. E. Winget, vice-president of the South Carolina Independent Telephone Association, presided at the traffic conference which was attended by approximately 45 chief operators from all parts of the state.

Miss Carrie Wortman, chief operator of Columbia, lead the discussion, and addressed the group on toll operating practices. Local operating practices were discussed by Miss Josie Hiott of the South Carolina Continental Telephone Co., Inc., Sumter.

Twenty-two men attended the plant conference, which was presided over by S. L. Bell, Chester Telephone Co., Chester. Mr. Bell gave a very interesting introduction to the subjects to be discussed and brought out the very important thought of the necessity of preventive maintenance rather than corrective maintenance.

Mr. Bell's introduction was followed by talks and discussions on cable maintenance, open-wire and pole line maintenance, and drop wire and station maintenance. These three discussions were conducted by L. A. Barnes of Rock Hill, R. L. Knell of Abbeville and W. R. Nabors of Sumter, respectively.

The discussions were entered into by those present and many questions regarding maintenance were discussed and questions answered. Highlights of the discussions included aerial cable protection, pole-line inspections, open-wire interferences, station equipment inspections and preventive maintenance routines.

L. E. WINGET, Sumter, vice-president of the South Caroline association and general manager of the Southern Continental Telephone Co., Inc., reviewed the work of the Independent Pioneer Telephone Association and urged those with 10 years' service to join the organization.

After the conference the manufacturers' exhibits were visited. A "voice mirror" was displayed and visitors were given opportunity to hear their voices as others hear them.

The annual banquet was held Monday evening. Dr. Havilah Babcock from the University of South Carolina delivered an address, and a sextet from Columbia College entertained with musical selections. T. C. Thomasson of Lancaster, acted as toastmaster. He was assisted by C. B. Barksdale of Greenwood.

At the morning session on Tuesday, November 7, President Barnes introduced R. C. Reno of Fort Wayne, Ind., chairman of the insurance committee of the United States Independent Telephone Association.

Mr. Reno stated that farmers who have telephones on their farms can take advantage of lower insurance rates. He said the insurance underwriters are controlled by three boards—the western, middle states and eastern boards. The western board has worked with the national association and has worked out a very satisfactory schedule. Mr. Reno said he would be glad to work with and help the state association if it desired to approach the eastern board.

L. E. Winget of Sumter, vice-president of the association, reviewed the work of the Independent Pioneer Telephone Association and urged each telephone man with 10 years' service to become a member of the Pioneers. Mr. Winget gave many interesting facts regarding the work of the Pioneers.

Presentation of committee reports and election of directors concluded the convention program. Members returned to their respective companies well fortified with up-to-the-minute information on the industry's varied problems.

▼ ▼

## New Station Peak for Pomona, Calif., District

Showing a gain of 296 telephones over May 1, the new directories now being distributed by the Pomona, Calif., exchange of the Associated Telephone Co., Ltd., also reveal an all-time peak of 10,120 stations for the district comprising Pomona, Chino, Claremont, La Verne and San Dimas.

Greatest growth came in the month of October. An unusual change of 33 per cent in listings was noted, caused by new stations, discontinuance of service and changes of location.

▼ ▼

## New Device Enables Deaf Man to Telephone

Engineers of the Ohio Bell Telephone Co., Columbus, have perfected what is believed to be the first device of its kind making it possible for a deaf person to hear and carry on an ordinary conversation over the telephone.

Experimentation and completion of the device were incidents which followed, after a company salesman had taken an order for the installation of a telephone in the office of H. H. Flockemer, superintendent of the Ohio Home for the Aged and Infirm Deaf at Central College, a village located about 14 miles northeast of Columbus.

The order given by the superintendent of the institution, who is totally

deaf, was conditioned upon the company being able to install a service that he could use. Workmen of the company at first installed a "No. 23-A amplifier" in the hope that it would accomplish the purpose, but without result.

The next experiment was that of B. D. Redding of the engineering department in which two amplifiers were connected in tandem, intended to give the voice coming in over the receiver greater volume, augmented by a secondary lift equally strong. Again no results were produced.

Finally, it was decided to install a device known as a bone conduction receiver that fits on the mastoid bones behind the ear to produce sound through vibrations. Upon the first trial of this test, the deaf superintendent of the institution was able to hear, but could not understand words through the vibrations.

Having advanced this far, employes of the telephone company undertook the task of teaching the prospective subscriber to "read sound." In this process an employe read from a newspaper while Mr. Flockemer attempted to identify what he heard with what he read. After several lessons he could hear and understand an ordinary conversation over the telephone.

By the further installation of a desk microphone connected with the telephone receiver Mr. Flockemer can now carry on conversations with those who have occasion to visit his office; this is made possible through the operation of a switch .

▼ ▼

## October Station Gains of Pacific Bell Company

The Pacific Telephone & Telegraph Co. reports a net gain of 12,582 telephones in service in its five-state system during October. The company had increases of 10,454 in October, 1938 and 13,625 in October, 1937.

The system had 1,929,664 telephones in service in the three Pacific coast states and in Idaho and Nevada. The increase in the first ten months of this year was 76,435 telephones, compared with 54,182 in the 1938 period and 102,684 in 1937.

## *One Thing at a Time*

By ANNE BARNES

Traveling Chief Operator, Iowa Independent Telephone Association, Des Moines, Iowa

STRINGING PEARLS is not a difficult task, but you cannot safely put more than one on the string at a time. Should you try to quicken the job by holding one or more in the palm of your hand while in the act of trying to thread another one on, you are likely to drop one and lose time hunting for it. This means loss of time, maybe a pearl or two, your temper, and confusion.

Hetty Stone prided herself that she could handle more long distance calls than any other operator in the office. And she did, but how! Her method consisted of making skeleton notations on a scratch tablet or carrying them in her head when too busy to record them on tickets; working out on two, three, or more circuits at the same time; showing little regard for the requests or orders of inward operators; holding subscribers and operators on the line without regard for time limits. What were the results?

Illegible ticket records, discrepant calculagraph stamps, cancelled tickets, loss of subscriber and operator time, confusion, hard work, and temper.

Method makes work easy, hinders confusion, saves much time, and so in the long run, the quickest way to do many things is to do *one thing at a time.* "Dispatch is the life of business, and method is the soul of dispatch."

Over at our grocer's I watched a man empty a carton of pound packs of butter and place them in a refrigerator. There were two cartons and each contained exactly the same number of pounds. I said to myself: "If the butter were not weighed very accurately into pounds, the containers just large enough and no larger, the carton just right, the 24 pounds could not have been packed so snugly, neatly, and compactly."

Someone has said: "Method is like placing things in a box; a good packer will get in half as much again as a bad one."


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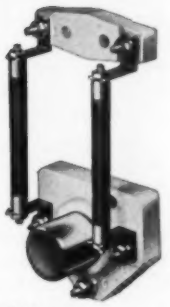

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# Hearings Concluded in Oklahoma Bell Rate Case

***WITNESSES of Southwestern Bell and of commission are cross-examined on reproduction new costs, with testimony explaining other costs which enter into the fixing of rates***

HEARINGS upon the application of the Southwestern Bell Telephone Co., for increased statewide telephone rates in Oklahoma were concluded November 17 before the Oklahoma Corporation Commission. The hearings opened October 19 and were conducted as rapidly as possible by the commission, with the cooperation of attorneys for both sides.

Chairman Reford Bond of the commission announced that as soon as all members of the commission are present, probably November 21, a ruling will be made upon the application of telephone company counsel for authority to give a supersedeas bond in connection with an appeal to the Oklahoma Supreme Court. This has been made from an order of the commission refusing to include in the statewide rate case consideration of application of the company for temporary rate increases in 21 cities of the state. John H. Cantrell, general attorney for the company in Oklahoma, as the hearings ended renewed his request for a ruling by the commission on the supersedeas bond request.

### *Information Requested on Salaries and Toll Rates*

At the conclusion of the taking of testimony, Corporation Commissioner Ray O. Weems asked the Southwestern Bell Telephone Co. to submit a list of all executives and employes of the company whose annual salaries are $1,800 or more. Attorney Cantrell agreed to furnish this information as soon as possible.

Paul R. Reed, special auditor in charge of the bureau of accounting of the corporation commission, asked the company to furnish information showing comparisons between interstate and intrastate toll rates in Oklahoma charged for same distances. Counsel for the company agreed to furnish this information within one week.

The commission will reserve its final decision on the statewide rate case until each member has read the part of the record of the hearings which he did not hear from the bench.

Paul R. Reed was cross-examined by counsel for the Southwestern Bell company on his exhibits and testimony showing lower annual rates of depreciation than total rates deemed necessary by the company. He explained that his depreciation rates were based only on reports of the company for each of certain years.

H. R. Fritz, of St. Louis, inventory costs engineer, Southwestern Bell Telephone Co., was recalled. He testified that other elements in addition to experience of the company as to deterioration of property for any given year should be considered in figuring annual depreciation rates, such as retirements forced by growth of towns, future requirements of authorities and provision for replacement of property destroyed by fires, floods, storms and other uncontrollable or unpredictable causes.

Replying to Mr. Reed's testimony, he stated that he believed the portion of the $100,000,000 depreciation reserve fund of the Southwestern Bell system, which is set up to cover possible losses ordinarily included by many other companies in insurance policies, should pay a reasonable rate of interest return into the fund. Mr. Fritz had previously explained that the telephone company does not carry insurance on its buildings and plant but pays only such fees as are necessary to secure regular inspection services. Losses of this kind are paid out of the depreciation reserve fund, Mr. Fritz had testified.

### *Company Labor Costs Based on Union Contracts*

Everett Cotter, Oklahoma City, general counsel of the Southwestern Telephone Workers' Union (a labor organization with about 17,000 members in the territory of the Southwestern Bell Telephone Co., and about 3,600 in Oklahoma), produced witnesses to show the nature of its contracts with the company.

He placed on the witness stand Erwin D. Cotter of Oklahoma City, secretary-treasurer of the Oklahoma area of the union, to explain the process by which the employes bargain with the company for wage-hour and working conditions contracts.

George H. Wilson, city attorney of Enid, representing Southwestern Bell telephone subscribers in that city, brought out from the witness that the public is not represented in bargaining conferences held between Southwestern Bell executives and representatives of the telephone workers' union.

The purpose of Mr. Cotter's testimony was to show that the Bell company is required, under the Wagner act, to bargain with the representative organization of its employes; and that the company, in Oklahoma and other states, operates under contracts with that union which require pay for vacations, sick leaves, holidays, and provide for certain progressions in wage scales. These elements were not taken into consideration by the corporation commission's experts in their exhibits estimating labor costs for theoretical reproduction of the property of the telephone company in Oklahoma as of December 31, 1938.

In response to a question from Commissioner Weems near the close of the hearing, counsel for the Bell stated that his company, under the Wagner act, was required to bargain with its employes. While it did not yield to all demands of the union, it has a contract with the labor organization which was in force in 1938, the year used as a base for fixing reproduction new costs.

B. Richardson, telephone engineer of the commission, on cross-examination previously had stated that he did not take this contract into consideration in fixing his valuations. He expressed the belief that if the whole plant in the state were to be reconstructed, plenty of labor could be secured at rates lower than those figured to make up the man-hour cost units as testified to by Bell company witnesses.

At the request of Mr. Richardson, D. D. Zimmerman, clerk in the telephone department of the commission, was called to testify on cross-examination on costs of reproducing conduits and manholes. He said that costs of excavations varied as to the nature of the soil and rock formations encountered. In figuring the man-hours unit for this work, he testified that he used the same basis as employed by Mr. Richardson, which made the labor cost

estimates fall considerably below the estimates of Bell company experts.

S. O. Wood, of the commission's telephone department, at the request of Mr. Richardson testified on cross-examination on costs of cable splicing. Again the method of figuring man-hours, previously employed by Mr. Richardson, was used which brought cable-splicing labor estimates considerably below figures presented in exhibits of the Bell company. Company counsel claimed that certain cable-splicing operations were omitted entirely from figures of Mr. Richardson and Mr. Wood.

***Comparison of Bell and Independent Exchange Operations***

Both of these in response to requests of commission attorneys, L. V. Reid and S. J. Gordon, compared revenues and expenses of some Independent and Bell telephone exchanges in Oklahoma. Mr. Richardson introduced an exhibit making such comparisons in 20 Bell and 20 Independent telephone exchanges, with comparable number of stations. Mr. Reed testified that on the basis of exchange revenue only, expenses for Independent telephone exchanges in many instances are much lower than expenses of Bell exchanges on a comparable basis.

Company counsel contended that there can be no comparable basis for figuring expenses as between Bell and Independent exchanges in Oklahoma. Most Bell exchanges in the state, he said, are much larger than Independent exchanges and this with several other vital differences in structure and operation makes comparisons impossible.

H. J. Wilmer, Oklahoma City, supervising construction engineer of the Southwestern Bell, testified at length on cable splicing. He said that many cable-splicing operations had been left out of consideration by the commission experts in estimating reproduction new costs of the property. He said that 2,000 more man-hours were used in cable-splicing operations in the Norman exchange alone than were figured in reproduction cost new figures of the commission experts.

Near the close of the hearing, M. L. Pearcey, St. Louis, Mo., general commercial engineer of the Southwestern Bell, explained the differences between "board-to-board" practice and the "station-to-station" theory, as a basis of fixing rates and allocating toll revenues. He testified that his company follows the "board-to-board" practice entirely in its operations and that the Interstate Commerce Commission (now the FCC) and the state regulatory bodies recognize this method exclusively.

The witness also offered an exhibit outlining the method of fixing telephone rates on a statewide grouping basis. For purposes of the exhibit he tentatively classified the exchanges of his company in Oklahoma into nine groups. The rates for comparable service were the same for each exchange in a particular group.

The first suggested group carried exchanges having one to 149 stations, with uniform suggested rates of $2.50 for business and $1.50 for residence telephones. The witness explained that rates would also be uniform in each of the other groups, but would be stepped up to higher levels. For example, suggested business rates in group VI were 50 cents per month higher for all exchanges falling under that group.

Any exchange could be transferred from one group to another when a change in the number of stations indicated that it belonged in a higher or lower group classification. He said that this group method of fixing telephone rates on a statewide basis was employed in several states.

Mr. Pearcey explained that if the group method were used in fixing telephone rates for his company in Oklahoma, groupings should be arranged and rates fixed so as to make each group bear its proper share in yielding the overall return necessary to produce a fair return on the total of the properties in the state. If such a method were used, he said, the fact whether a single exchange produced its fair share of the overall net revenues would become relatively less important.

There was no statement on the part of the company that it intended to ask that the statewide group method be adopted by the Oklahoma Corporation Commission. Company counsel stated that the testimony was introduced to acquaint the commission and its department heads with the method.

Mr. Pearcey, who is charged with the duty of making suggested rate schedules for his company, expressed the opinion that larger cities like Oklahoma City and Tulsa should yield a larger percentage return than smaller exchanges, because service is worth more to subscribers in the larger cities.

▼ ▼

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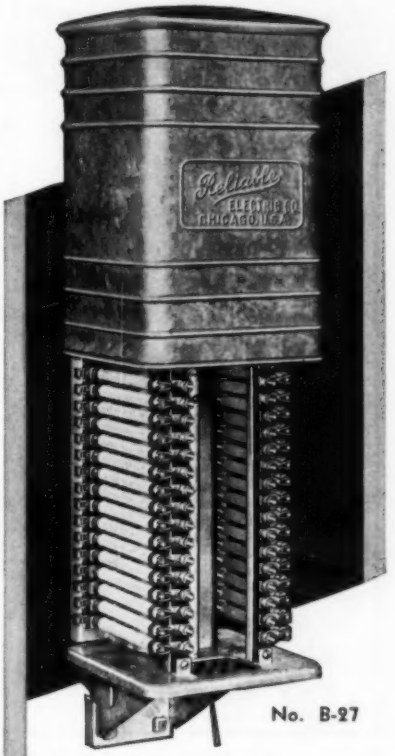


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## CONVERSION OF SMALL EXCHANGES

*(Continued from page 27)*

mediate office B should be so arranged that whenever a zero call is made at tributary C the mechanism at the intermediate exchange B will automatically switch the call through to a trunk to the toll center.

Tandeming or automatic switching of toll lines through an intermediate office may become more frequent as more towns are converted to dial service. The condition which brings this about is illustrated by Fig. 3. With manual operation at exchange B an operator is available to properly route a toll call. Hence, to avoid "back-haul," some tributaries at present are privileged to handle traffic to nearby offices such as C without passing through the toll center. With dial service, the subscriber should dial 0, irrespective of the destination of the call. Hence, such traffic as calls between exchanges B and C should be handled by the toll center.

This means back-hauling some traffic and existing toll circuits to the toll center may become overloaded. However, by cutting the circuit between A and C at town B, we reach the condition shown in Fig. 3, labeled "After."

Tributary C still has two circuits over which the toll center may be reached and tributary B now has three circuits with which to reach the toll center. Three circuits operating as a group will carry more traffic than when working in two groups. Thus, even though some traffic may be back-hauled, the use of tandem equipment at B may avoid the necessity of stringing additional circuits.

The simple call like one from tributary C to intermediate office B, Fig. 3, involves going through the master office and ties up two toll lines of considerable length, whereas formerly on calls between C and B only one shorter circuit was involved. To minimize the back-haul and to cut down on circuit usage, it is possible to install not only tandem equipment at the intermediate town B but also to provide another arrangement not discussed before called "dial-back equipment."

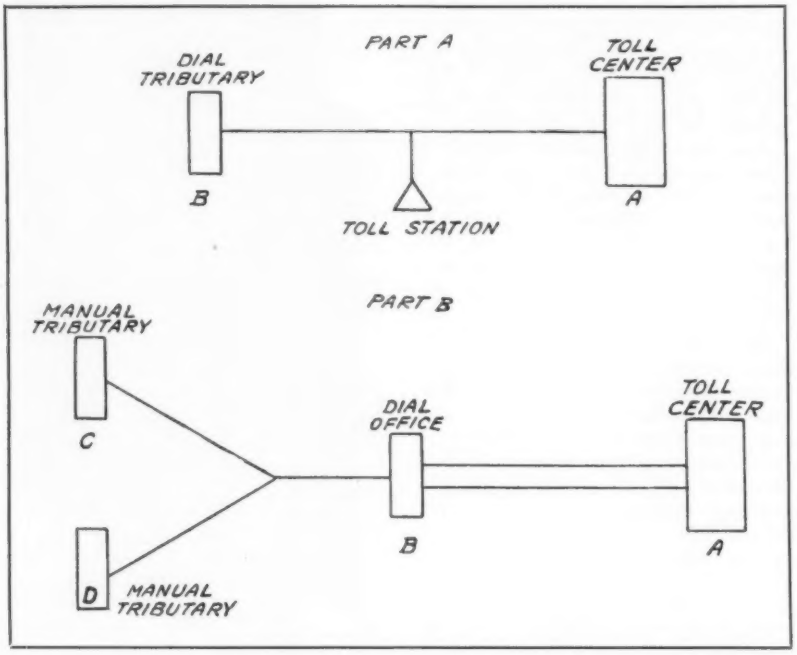


Fig. 4. A toll station on a trunk to the toll center or two tributaries on a line bring complications in signaling.

This may sound a trifle complicated, so let us trace a call. A subscriber at C dials 0, and the switches associated with the trunk in town B automatically connect the subscriber to the toll center. The operator ascertains the wishes of the subscriber at town C and finds out that he wishes to talk to, say, a subscriber in town B.

The toll center operator may dial a single digit on the same trunk over which the call came. This will operate dial-back switches in B, connecting the trunk between C and B to the local equipment at B. The operator at A then hears the dial tone from B and proceeds to dial the subscriber's number at B, and the connection is established directly from the subscriber at C to the subscriber at B.

From this point on there are usually two optional operating arrangements. If the call between C and B is a toll call, which should be ticketed and timed, the operator will leave up her connection at A and time the call through the usual hook-switch supervision. This procedure, of course, ties up the one trunk between C and B and another between B and A. But it does not tie up three trunks, as would be the case without the dial-back arrangement.

Sometimes it is not worth while to time the call, or the call may be made by a subscriber entitled to extended scope or so-called "free" district service to the next town and it is not necessary to time the call. The operator may then, upon completion of the dialing, disconnect from the trunk at A, whereupon that trunk between A and B is free for other calls.

The connection between C and B remains established until the subscribers hang up. Then, all switches are restored to normal without any further attention on the part of the operator. Whether or not it is desirable to employ tandem trunking equipment or dial-back equipment may depend upon circuit loads to a large extent and upon the relative cost of the equipment as compared with the cost of providing additional toll line circuits by stringing or otherwise.

An experience with the dial-back arrangement illustrates what may happen with new developments which look well on paper and yet have some shortcomings in actual service. In our first dial-back installation in Nebraska, the equipment worked perfectly when it was cut into service. However, a few days later we had a thunderstorm, with considerable lightning, and then we found an unexpected kink in the dial-back trunks.

It was found that when the subscribers were talking between C and A, a flash of lightning would produce a pulse on the line which would operate the dial-back equipment at B, just as though the operator had dialed the digit "1" which was used for this purpose.

Fortunately, in this instance, it was rather simple to make some modifications and to use the digit "3" for the operators and to nullify the effect of a single digit. Thus far we

have not had any lightning in Nebraska of just the right kind to give us three pulses and operate the dial-back switches.

Since toll center trunks are often phantomed and since the dial signaling is by direct current, we are, of course, forced into the use of composite sets in order to obtain the necessary direct current signal. These composite sets are very similar to the composite sets employed for telegraph use. They are, however, somewhat less expensive, since the requirements are less severe, due to the use of lower voltages and, in general, shorter distances. Then there is an impulse repeater required to translate the grounded single-wire composite leg pulses into the usual two-wire or loop-dialing pulses which the local equipment requires. All of these arrangements may be obtained from the various manufacturers.

The use of composite equipment, however, brings in one little problem which might easily be overlooked. With composite equipment on the line, it is not possible for a lineman shooting a case of trouble to get in on the toll line with his usual test set. The composite sets will not pass the 20-cycle ringing from his set; hence he cannot signal the master office operator.

Where the master office trunks are on a toll line having telephone circuits not used for master office purposes, he can often reach the master office by cutting in on these other lines. However, the master office trunks are sometimes the only ones on the line.

There is under development a set which will probably make use of the radio battery of 45 volts, which the lineman must connect to ground in order to signal the central office. Once the central office operator has been reached, the lineman can talk to her with his conventional test set.

If tributary C (in Fig. 3) remains a manual office after tributary B has been converted to dial, the manual office may reach the toll center in one of two ways:

The switchboard may be equipped with a dial and connected to the dial office in B. In case the operator at C is permitted to complete calls to B, the trunk may be connected to a simple line circuit or to a special selector. This will give the operator access to all the subscribers at B, as well as access to the toll center at A. If the operator at C is not privileged to complete calls to B, the trunks between C and B may be terminated on special equipment which will give the operator access only to toll center A.

It is also possible to dispense with a dial at manual office C. With this method the trunk between C and B remains on a ringdown basis. The manual office operator rings on the line as heretofore and then the switches at the dial office cut the line through automatically to the toll center. From then on, the connection is under the control of the toll center. This point is important because failure of the operator at C to ring off will not keep her line busy indefinitely. The toll center operator at A may dial on her trunks to B and reach C just as she would on any other line connected to the exchange at B.

When a trunk to the toll center has a toll station on it, or when there are two tributaries on a line, complications in signaling arise (See Fig. 4). There are also other more complicated conditions than have been illustrated. However, the various manufacturers have developed many arrangements and the dial equipment is sufficiently flexible to meet practically all conditions.

In addition to the three factors of equipment, stations and trunking, there are many other factors to be dealt with in converting to dial service in small communities. However, the general situation may be summarized with the statement that there are thousands of small dial installations all over the country meeting the peculiar local conditions. The development of dial service is a continuation of the natural progress in simplifying the work of the operator and having more work done by the machine.

## COMING CONVENTIONS

**Minnesota Telephone Association, Radisson Hotel, Minneapolis, January 23, 24 and 25.**

**Kansas Telephone Association, Hotel Kansan, Topeka, April 3 and 4.**

**Nebraska Telephone Association, Hotel Fort Kearney, Kearney, April 9 and 10.**

**Indiana Telephone Association, Claypool Hotel, Indianapolis, May 8 and 9.**

**Pennsylvania Independent Telephone Association, Yorktowne Hotel, York, May 16 and 17.**

**The Illinois Telephone Association, Hotel Pere Marquette, Peoria, May 28 and 29.**

**New York State Telephone Association, Hotel Syracuse, Syracuse, June 5 and 6.**


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| 1000 to | 5000 | feet | 10.65 | 11.50 |
| 5000 to | 10000 | feet | 10.00 | 10.80 |
| 10000 to | 25000 | feet | 9.40 | 10.20 |
| 25000 to | 100000 | feet | 9.10 | 9.85 |
| | | | **Parallel Pair** | |
| Up to | 1000 | feet | 10.50 | 12.30 |
| 1000 to | 5000 | feet | 9.35 | 10.95 |
| 5000 to | 10000 | feet | 8.75 | 10.25 |
| 10000 to | 25000 | feet | 8.25 | 9.65 |
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# *Here and There in the Field*

## Government Survey Discloses Farm Subscriber Loss

Monthly telephone rates to farmers are about 30 per cent higher than before the World War, according to a survey made by the Bureau of Agricultural Economics. Results of the survey also indicate that farmers spend about $32,000,000 annually for telephone service, an average of about $4.75 for all farm families in the United States and about $18 per farm family with service. In 1935-1936 telephone service charges amounted to about 1 per cent of the total expenditures for farm family living.

The use of telephones on farms has been fairly widespread in the last 25 years or more. It is estimated that as early as 1912 about 30 per cent of the farms in the United States were connected with telephone service compared with 39 per cent in 1920 and 34 per cent in 1930. The survey for the year 1935-1936 indicates that there has been some decline since 1930 in the percentage of farms having telephones.

"With the farm usually situated at a considerable distance from medical facilities and marketing centers," says the report on the survey, "telephone service may be considered as almost a necessity in modern farm life.'"

Because of the widespread use of telephones and the substantial total expenditure involved, rates to farmers in selected periods from 1910 to 1936 were collected by the government bureau. Nineteen states were chosen to represent each of the regions commonly used in census reports and the charges for rural service by urban commercial companies, farmer or rural companies and mutual companies were obtained.

The survey disclosed that although rates in the post-war periods have been about 30 per cent higher than in the period 1910-1914, the increase was accompanied by improvement in both the quantity and quality of service. Exchange facilities have been improved and extended in wider areas and better equipment has resulted in marked progress in clear reception. Furthermore, in the 1910-1914 period it was a common practice for the farmer to construct his own line and purchase the instruments, whereas these costs are now generally borne by the companies.

The decline in the number of farm telephones in 1930 compared with 1920 may be due in a large part, the survey states, to a reduction in the number of small town exchanges and cooperative systems, these being largely absorbed in extensions of large exchanges or by the combination of smaller exchanges into larger exchanges.

The small cooperative line was likely to find itself at a disadvantage in competition with the larger exchanges and an exchange hook-up increased the cost of service to the farmers. Consequently some farmers discontinued the service. The improvement of roads and the increasing use of the automobile may also have contributed in some measure to the reduction.

Apparently about one-third of the farms in the United States have telephone service. Farmers in the north central states are the most extensive users of telephones, with New England second. In the south telephones are not common among farmers.

In some sections of the country the family use of telephones appears to be more common on farms than in cities. Comparing the residential telephones reported in 1932 with the number of families reported in the census of 1930, it is found that about 37 per cent of the families in the United States had telephones. This percentage was about the same for the country as a whole as for farms. In northern regions the telephone is more common in the farm home, but in southern and far western regions it is more common in the city than in the country.

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## Large Attendance at Ohio District Meetings

The last of three successful fall district meetings of the Ohio Independent Telephone Association was held at Bellefontaine on November 1. The meeting was attended by a large number of telephone men not only from different sections of Ohio, but from adjoining states as well. Frank Binkley, general manager, and officers of the United Telephone Co. were hosts to the visiting representatives.

John T. Carliss of Marion, president of the association, and Frank L. McKinney, secretary-treasurer, made the same addresses as at the district meet-

ings held at Warren and Mansfield. Attendance at all three district meetings exceeded that of similar meetings held in previous years.

H. S. Warwick, Columbus, spoke to the gathering in opposition to the proposed Bigelow old age pension amendment to the state constitution, and the proposed amendment to reduce the number of signatures required on referendum petitions. The association waged a vigorous campaign against both of the amendments which were defeated at the election on November 7.

## Virginia Company Winner in Safety Contest

The East Coast Telephones, Inc., of Warsaw, Va., recently won first place in the national fleet safety contest sponsored by the National Safety Council. The company was entered in the public utilities small fleet division and finished an entire year without a single reported accident.

The telephone company had six cars entered in the contest that traveled a total of 171,999 miles. During the same period, two cars of the Gloucester division of the company traveled 41,958 miles, giving the company a total of 213,957 accident-free miles in the past year.

Training in the proper operation of motor vehicles is one feature of safety training conducted by the company for the benefit of its employes apd the public. Rodney M. Coggin, vice-president and general manager of East Coast Telephones, Inc., attended the recent National Safety Congress and Exposition at Atlantic City where trophies were presented the winning fleets.

## Quality and Appeal Sell Rural Service

A recent survey of rural telephone development, made by the Bell Telephone Co. of Pennsylvania and described in the current bulletin of the Pennsylvania Independent Telephone Association, provides information of interest to companies in rural areas.

The survey shows that in central and eastern Pennsylvania the number of farms with telephone service has dropped from 43.3 per cent in 1930 to 31.7 per cent in 1938. During this same period the number of farms with electric service has increased from 19.3 per cent to 42.5 per cent. It also shows that the Independent companies of the state serve slightly more than 70 per cent of all secondary stations while the Bell company serves less than 30 per cent.

Efforts were made to determine the cause for the decrease in rural telephone users as well as the reason for the growth in electric users. The study confirmed previous conclusions that the decrease could be attributed to:

Decline of farm prices; extension of base-rate areas; progressive improvement in automobile and highway design plus the reduction in the purchase price of the former; increasing difference between the farmer's income and the price he has to pay; labor saving and increased production afforded by electric service; reduction of the "free service" area and introduction of toll rates; depreciated subscriber-owned lines with no provision or reserve for replacement; overloaded lines; unreliable service, and lack of consideration given to community of interest and primary and secondary trading centers.

The study closes with an encouraging analysis of the Pennsylvania Bell company's recent activities directed toward increasing the number of rural subscribers. It is noted that while the company has recovered only 90 per cent of its peak business in the base-rate area, it has recaptured 100 per cent of the secondary main stations.

The Pennsylvania Bell expresses the opinion that if the farmer can pay for electric service he will also find the money to pay for telephone service if he can be made to want the service badly enough.

After digesting the survey H. M. Stewart, executive secretary of the Pennsylvania association, consulted the files of the Denver & Ephrata Telephone & Telegraph Co., Ephrata, one of the state's leading Independent companies. He found that in 1925 the company served 1,194 rural stations, of which 500 were subscriber-owned. In 1930 it served 1,159 rural stations, 200 of which were subscriber-owned. In 1935 there were 1,271 rural stations, only 12 of which were subscriber-owned.

At the close of business in 1938 the Denver & Ephrata company was serving 1,363 company-owned and 12 subscriber-owned rural stations, representing a gain of 15 per cent over 1925 and 18 per cent over 1930.

Mr. Stewart comments that the experience of the Denver & Ephrata company—of company-owned stations in service doubling while subscriber-owned stations almost disappeared—seems to indicate that Pennsylvania Bell engineers were correct in concluding that the rural resident will find the money to pay for service provided it is of sufficient quality and has the right appeal.

The performance you get from one Burgess telephone battery sets the pace for all the others. There won't be any "black sheep" or costly servicing to replace units that don't live up to your requirements.

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# The Manufacturers' Department

## Automatic Electric's New Wall-Mounting Monophone

Automatic Electric Company is now in production on a new wall-mounting Monophone. It is known as type 50 and was designed as a companion to the type 40 desk Monophone introduced a year ago. Both models were

New Automatic Electric type 50 wall Monophone with dial. Manual models are supplied with replaceable dial blank.

featured in Automatic Electric's exhibit of modern telephones at the recent national convention in Chicago.

In basic exterior arrangement, the type 50 Monophone carries out the innovation which the type 35A5 first brought to wall telephone design; that is, it consists of a wall case of molded plastic, with the handset resting crosswise on a cradle beneath the dial. In other respects, however, it is quite different, as it uses the same handset as the type 40 and the internal assembly is arranged to accommodate parts which are interchangeable with those of the type 40. Chromium-plated bands on the handset and chromium-plated front dial plate are standard features.

Having the same handset, circuit and transmission components as its desk companion, the type 50 Monophone has also the same high transmission characteristics. Contributing to the transmission performance of these two telephones are several improvements which will be of particular interest to the operating engineer who is responsible for maintaining high transmission standards over local and long distance circuits. Among these are:

1. A high fidelity transmitter delivering a response curve which is stated to be free from high peaks at any frequency, with the high-frequency cut-off occurring above 3,500 cycles.

2. A damped receiver, having negligible variation in its reproduction of frequencies between 300 and 3,000 cycles. This characteristic provides high fidelity reproduction of the voice, low apparent sidetone and improved transmission over circuits having high attenuation characteristics.

3. An overall frequency response which rises gradually from 300 to 3,000 cycles, thus compensating for the greater attenuation of high frequencies in cable circuits.

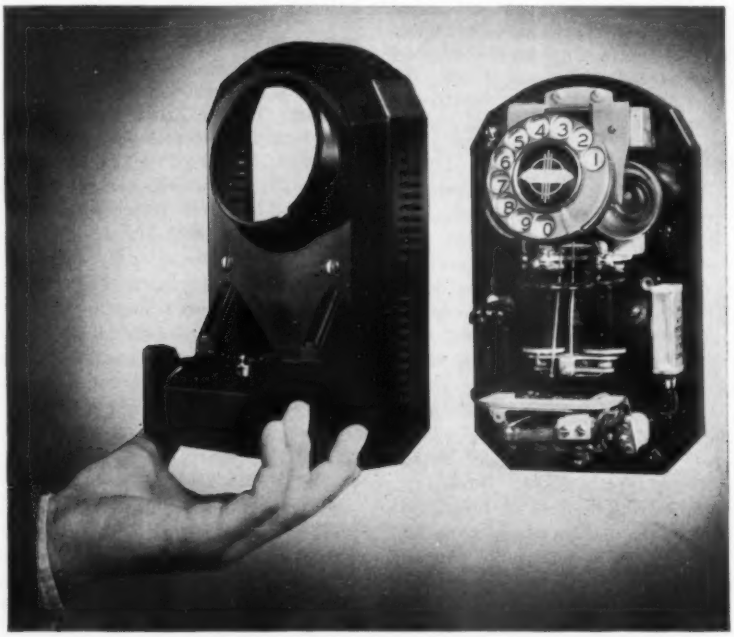
4. An exclusive new circuit with high quality components. This is said to establish a new high standard of transmission efficiency, and to provide a coordination of anti-sidetone characteristics favoring transmission under conditions of high attenuation and avoiding too much volume or sidetone on circuits of minimum attenuation.

The ideal of completely interchangeable parts has been more closely approached by the types 40 and 50 Monophones than with previous "companion" designs. As the two handsets are identical, their components are interchangeable, as also are the ringer, induction coil and the ringing and talking condensers.

The base plate of the type 50 Monophone is a sturdy plastic molding, provided with mounting holes spaced to permit fastening of the telephone to any type of wall. Where the line wires are run in conduit, the telephone may be mounted on a standard four-inch outlet box through the use of an adapter. After the base plate comes from the molding press, the holes are left with thin "knockout" closures, which may be removed as desired, leaving the remaining ones closed as an aid to excluding dust and insects.

All apparatus inside the case is carried entirely by the base plate, the molded cover being wholly free of wiring or apparatus. Because of this design, the cover can be quickly removed, leaving the entire base assembly with all parts and terminals exposed for examination or to facilitate installation. This is accomplished by loosening the two cover screws, removing the switch-plunger bushing, and lifting the cover off.

Another feature that has proved attractive to operating men is the new ringer, which is of standard size and has sufficient impedance to provide good dialing range on standard automatic systems. The ringer is equipped with large two-tone gongs. They furnish a signal of exceptionally pleasing quality and at the same time provide



The cover of the type 50 Monophone may be quickly removed, leaving the entire base assembly accessible for inspection.

The new Nicopress tool for use on No. 12 high tensile strength steel wire.

excellent penetration through surrounding noise.

As with the type 40 Monophone, the ringer mechanism is floated in live rubber bushings. The same equipment is used for either metallic ringing or ringing to ground; the latter requiring only a simple change in wiring connections at the time of installation.

To meet many different subscriber requirements, the type 50 is available with an extensive range of variables, such as harmonic ringers of any frequency, high-impedance ringers, colored molded parts with metal trim in gold or chromium-plate, super-volume circuit and transmitter for unusually poor transmission circuits, extra push button for special circuit operations, etc. The type 50 Monophone is available with dial for use on automatic exchanges or with dial blank (convertible) for manual exchanges.

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## New Splicing Tool for HTL Steel Line Wire

The National Telephone Supply Co., after many months of research and test, has just placed on the market a new Nicopress tool. This tool is especially designed for the splicing of "85," "135," and "BB," No. 12 BWG galvanized steel wire.

In planning this No. 31-D Nicopress tool, National engineers have laid special stress on the design of the leverage system, to assure great ease of operation of the tool by the lineman. With comparatively light pressure on the handles the required force to make tight, strong splices, is easily obtained. This force is about 80 times the handle pressure.

This new Nicopress tool is compact and light; it is only 11 inches long and weighs but two pounds. It is very convenient for the lineman to carry, either with or without holster. (Special holsters are made for this tool.)

The uniquely-designed, man-sized, "palm-fitting" handles, it is said, assure ease of handling by the lineman when working either on the ground or in the air.

Nicopress sleeves for use with this tool in splicing are available for all strengths of No. 12 BWG galvanized steel wire ("85," "135" and "BB").

National's executives and engineers feel that with the development of this new Nicopress tool they have made available for those using No. 12 BWG steel conductors an exceptionally simple, effective and economic method of splicing this type conductor. They claim that with the use of the 31-D tool and Nicopress splices high strength splices can be made on high strength steel wire.

Literature and price list can be secured by addressing this publication or writing directly to the National Telephone Supply Co., 5100 Superior Avenue, Cleveland, Ohio.

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## W. N. Matthews Corp. Has New Florida Agent

The W. N. Matthews Corp., of St. Louis, Mo., has announced the appointment of Robert Moscrip as agent for the sale of Matthews products in Florida. Mr. Moscrip is well recommended as one who is familiar with the needs of telephone companies.

At present he is located in Miami and may be addressed at 205 Exchange Hotel, P. O. Box 630, Miami. Any questions regarding the specialties manufactured by the Matthews corporation will receive his immediate attention.

▼ ▼

## The New Hubbard "Hercules" Expanding Anchor

A new Hercules expanding anchor, manufactured by Hubbard & Co., Pittsburgh, Pa., is available in three sizes: The six-inch, two-way anchor, finished in black, has an expanded area of 70 square inches; the eight-inch, two-way anchor is finished in green and has an expanded area of 110 square inches, and the blue-finished, eight-inch, two-way anchor has an expanded area of 140 square inches.

The Hubbard Hercules anchors have been constructed primarily to provide a large holding area against undisturbed earth. However, many other qualifications have been worked out to provide easy installation without detracting from the general anchorage value. First of the installation qualities claimed for this anchor is the method of setting it. After the hole is dug the anchor and rod are lowered into place at the bottom. Expansion is accomplished by driving on the top of the anchor with a standard installing tool or a pipe large enough to slide off over the eye of the anchor rod.


for Efficient
**TEMPORARY**
or
**PERMANENT**
**GUYING**—*Use*
KEARNEY
***No-Rench***
**SCREW ANCHORS**

• *They can be Salvaged*

**FEATURES**
*Quality steel rod is firmly attached to helix... special blade curvature, sharp, curved lip makes anchor easy to start and install.*

MAKE temporary guys — remove them, if you like, and take your anchor with you—if you use Kearney No-Rench Anchors. Rod and helix of these sturdy, Certified Specification Malleable Iron Screw Anchors are a single unit . . . permits you to salvage them by merely screwing them out . . . And, of course, they're used for permanent guying, too . . . holding powers—2000 lbs. to 13,000 lbs. in clay—depending on anchor size.

**The 4-inch Anchor**
*Just the thing for inexpensive guying of bracket or single phase ridge pin lines.*

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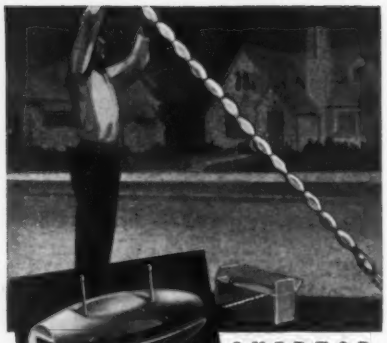

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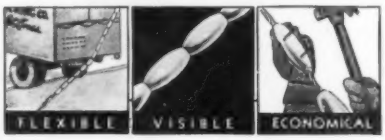
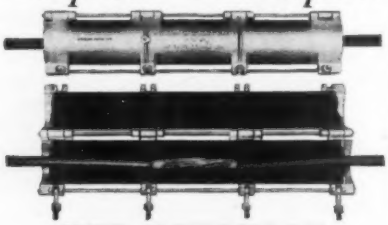



*Remarkable New Invention Speeds Telephone Cable Repairs*



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**(Patent Pending)**

● The Cavanagh Cable Repair Sleeve is a quick and positive means of repairing cables damaged by storm, friction or other causes. Saves labor, time, and material. The tubular sleeve, 19½" long overall, is a durable die casting. All steel parts are cadmium plated. It comes in nine sizes to accommodate 30 sizes of cables containing 11 to 606 pairs. Inner surface of cylinder is treated with a special rubber insulating compound. Laboratory tests at temperatures from —30° to +212° show no condensation. Pressure tests prove it absolutely free from leakage. May be used several times or permanently. Also recommended as an insulating joint. Reconditioned at small cost. Manufactured by St. Charles Manufacturing Company, St. Charles, Illinois.

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A small wire secures the wings in the closed position until the first blow is struck. This blow breaks the wire allowing the wings to take their first "bite" into the walls of the hole. The continued driving is said to not only force the wings to spread into the hard earth but also draws the anchor firmly against the bottom of the hole. When the wings are completely spread, the sound of the blow changes to a solid impact of metal against metal, making the final stage of expansion easy to check.

New Hubbard "Hercules" Expanding Anchor.

The design of the new anchor is claimed to prevent the rod nut from turning, saving much annoyance and allowing the rods to be reclaimed. Another feature is in the mechanics of the expansion. As the wings are spread, a point is reached at approximately one-third of the total downward travel of the top or hinges of the anchor, where the expanding action starts to draw the anchor into the bottom of the hole.

As the wings are spread farther, the top piece passes dead center and slides into the fully expanded position. Any strain on the rod when the anchor is completely open, tends to hold the wings in the spread position thereby eliminating any possibility of collapse, it is claimed.

▼ ▼

## Kellogg Masterbuilt Junior for South Hill, Va.

BY A. W. SCHELL

*Representative, Kellogg Switchboard & Supply Co.*

South Hill, the center of Mecklenburg county, in southern Virginia, lies in the midst of a land of hills and streams. Its settlement dates back very early in the history of the state but it was not incorporated until 1901. A few years later came the first telephone system — privately-owned and small.

Stimulated by the coming of a railroad, then by the discovery that the soils around were ideally adapted to the growing of "bright" tobacco, both the town and the telephone system grew. Thirty years after the incorporation of the town, and almost as many after the founding of the original telephone system, the exchange was purchased by the present owners, the Virginia Telephone & Telegraph Co. with headquarters at Charlottesville. There were then just above 200 subscribers served.

In its class, this exchange from 1932 to 1937 won the distinction of showing the best collection efficiency; and in 1937 it won the company's trophy for the greatest increase in telephones. Today, the South Hill exchange is serving 300 subscribers through the new Kellogg Masterbuilt junior switchboard. With improved service provided by the new central office installation, future growth should be even more marked.

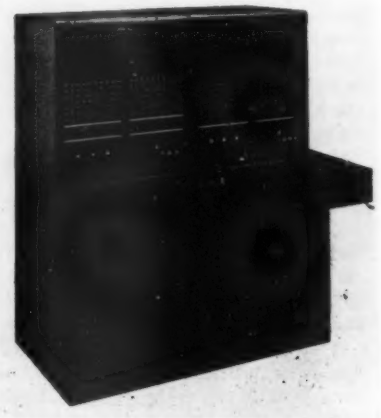
The new Masterbuilt junior board has two positions on a non-multiple basis. It is equipped with 240 common battery local lines, 10 toll lines and 10 rural lines, and has an ultimate capacity of 400 lines. Thirty two-party divided automatic ringing cord circuits are provided.

▼ ▼

## Chillicothe, Ohio, to Have Automatic Electric Equipment

Announcement has been made by the Chillicothe (Ohio) Telephone Co. that Chillicothe's 6,000 telephones will be converted to automatic operation by next August. Orders have been placed with American Automatic Electric Sales Company for the equipment, which will be manufactured by Automatic Electric Company.

Work has already begun on remodeling of part of the present company headquarters. In addition, a new 28,000-cubic foot structure is to be erected to house the new equipment, Col. David McC. McKell, president of the Chillicothe company, states.



Two-position Masterbuilt junior switchboard on a non-multiple basis similar to the one recently installed at South Hill, Va.

# Commission and Court Activities

## Hearing Date Set for Apprentice Operators' Wages

A hearing on an application of the United States Independent Telephone Association to the Wage-Hour Division for approval of employment of apprentice operators at wages below the statutory minimum has been scheduled. It will be held in room 3229, Department of Labor building in Washington, D. C., at 10 o'clock Thursday morning, December 7.

Dr. Gustav Peck, assistant wage-hour hearing director, will preside. Those desiring appearance at the hearing must notify Dr. Peck before noon of December 5, stating the name of their organization and the approximate length of their testimony.

▼ ▼

## St. Paul Compromise Rate Order Set Aside

Judge Gustavus Loevinger in Ramsey County District Court on November 14 set aside the Minnesota Railroad & Warehouse Commission's May 2 "compromise" rate order (TELEPHONY, May 6, page 30) as it affects rates of the Tri-State Telephone & Telegraph Co. in St. Paul.

The ruling was in the form of a permanent injunction granted to Joseph C. Lenihan and Joseph P. Kilroy, St. Paul subscribers, restraining the commission, the attorney general of Minnesota and the Tri-State company from enforcing the May 2 order. Judge Loevinger's 15-page decision, unless reversed by higher courts, means that additional rate reductions, ordered by the commission in 1936 but never put into effect, will be observed in the St. Paul metropolitan area.

Judge Loevinger emphasized that his decision has no direct effect whatever on Minneapolis rates. They will continue at the May 2 "compromise" schedule, unless independent legal action is started in that city, he said.

The court also ordered the telephone company to make additional refunds to 85,000 subscribers in the St. Paul area. These subscribers already have received refunds of the difference between the 1936 rate and the present rate up to June 1 of this year. The additional refunds would be from June 1 to November 14.

A 40-days' stay of execution of the order was granted by the judge to enable the telephone company to appeal if it desires. The decision would mean a total revenue reduction of approximately $284,000 a year to the Tri-State company as the order applies to its operations in St. Paul, South St. Paul, St. Paul Park, North St. Paul, West St. Paul, Mendota, New Brighton, Rosetown, Inver Grove, and the Fort Snelling reservation.

The commission's 1936 rate reduction of 25 per cent was upheld by Judge Loevinger in 1937 and by the Minnesota Supreme Court last February. Then the commission, Attorney General J. A. A. Burnquist, and the telephone company effected the May 2 "compromise."

The compromise order cut the 25 per cent 1936 cut to 12 per cent, and lowered Minneapolis rates, which were not involved in the 1936 order, by about $650,000.

In his decision on November 14, Judge Loevinger: Voided the May 2 order "insofar as it purports to authorize an increase" over the 1936 rates in the St. Paul area; adjudged all telephone charges over the 1936 rates as "unlawful, unreasonable and arbitrary;" ordered refunds of the difference between 1936 rates and the May 2 order, with 6 per cent interest "from the date of the payment of said overcharges;" requires the telephone company to account to the court periodically "until all of said excess charges shall have been refunded," and granted a stay of 40 days in which the defendants may appeal.

In a lengthy memorandum accompanying his decision, Judge Loevinger made several pointed observations on the May 2 order and the circumstances surrounding it. He said in part:

"The order shows it does not contain detailed and specific findings of fact adequate to sustain the order. This conclusively establishes that the order is void. There is no fact issue for trial.

The court is of the opinion that the power of the attorney general and the commission to compromise the pending St. Paul rate case did not include the power to make a contract to exercise the rate-making power in a stipulated way as a part of such settlement.

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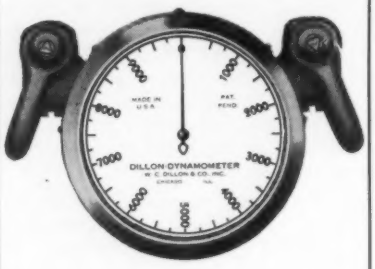


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The unavoidable inference is that the May order fixed rates for St. Paul not only on factors applicable to St. Paul and at levels acceptable to the defendant telephone company, but also on factors applicable to Minneapolis and at levels acceptable for the Minneapolis area to the Northwestern Bell Telephone Co."

The judge denied a trial requested by Minneapolis officials, who sought to maintain the May 2 order. The relation between Minneapolis and the telephone company was not the same as that between subscriber and the telephone company, he said, and did not form a basis for trial.

An appeal to the state supreme court from Judge Loevinger's decision is regarded as virtually certain in St. Paul. This would mean that present May 2 rates would remain in effect at least until a supreme court decision which probably could not be expected for six or eight months.

▼ ▼

## Nebraska Power District Ordered to De-energize Lines

By a vote of two to one, the Nebraska State Railway Commission November 13 upheld the protest of the Glenwood Telephone Co., a farmers' cooperative, to the paralleling of its grounded lines by the transmission lines of the Southern Nebraska Rural Public Power District. The commission ordered the district to de-energize the offending lines within the next 30 days.

When the district originally secured permission it was on the condition that during the time of construction, as junior occupant of the highway, it should bear all reasonable expenses necessary to insure safety, operation and efficiency of existing lines and its own lines, and that after construction it should bear all reasonable expense to remove interference.

At that time the telephone company was not a party for the reason that none of the power lines authorized were parallels. However, it became very much interested when the district, without authority from the commission, re-routed its lines so that they did parallel the telephone lines. Testimony of the company was that the cost of metallicizing the parallels would be nearly $1,000, and that only one out of seven of its subscribers were getting power in the disputed area.

Commissioner Good dissented on the ground that metallic line construction only was approved construction. He quoted an Arkansas State Supreme Court decision that where rural electrification progress was under consideration a grounded system was outmoded, and that in such an event it is not proper telephone construction and is to be remedied at telephone company expense. Mr. Good said highways are public property; that no one should be allowed to monopolize them for their own use, and that if a power district has to metallicize the lines of the telephone company the latter gets something for nothing.

The majority held to its former holding that grounded construction is lawful construction, and that the statutes specifically fix liability on power districts whose construction interferes with their efficient use.

▼ ▼

## FCC Regulations Urged to Aid Fight on Bookies

Grand jurors of Dade county, Florida, a center of winter horse racing, were on record on November 14 as "strongly" urging the Federal Communications Commission to promulgate regulations by which federal and state law enforcement officials could halt telephone service to bookmakers.

The jury, reporting to Judge Paul D. Barnes after 24 days' deliberation, asserted the telephone information was "the very heart and soul of this widespread gambling vice" and that existing laws make prosecution difficult.

▼ ▼

## Valuation Methods Studied in Washington Investigation

Details of the program used by the Pacific Telephone & Telegraph Co. in computing the estimated cost of reproducing the company's plant were described at hearings conducted by the Washington Department of Public Service during the week of November 13. The hearings are being held by the state department on changes in rate schedules proposed by the Pacific company for its Washington exchanges.

An attempt was made by the department of public service at the hearing on November 13 to show that the Western Electric Co. exaggerated its estimate of labor costs in figuring the expense of reproducing switchboard apparatus at the Pacific company's central office in Seattle.

C. S. Watt, a Western Electric engineer, under cross-examination by Albert Stephan, counsel for the department, testified that average unskilled workers could be employed in laying out flooring and in constructing superstructure for switchboard equipment which Mr. Watt previously estimated would cost $335,436 to reproduce.

He stressed, however, that careful supervision by expert foremen and technical workers would be required to

## ANSWERS TO TRAFFIC QUESTIONS ON PAGE 38

1. Please refer to the preface.
2. Enter "dup" in the upper right-hand corner on the face of the ticket and "cov by in" on the back of the ticket.
3. "I *will* give you Information" should not be used. The phrase "*Shall* I give you Information?" is used when an order is received without a telephone number and the number is not supplied at the time the operator says "What is the number, please?"
4. This entry should appear in the "Special Instruction" space, encircled, but not in green.
5. On a call carried forward from a preceding day, as soon as possible after 9:00 a.m. without interfering with the handling of other calls, reach the calling station and find out if the calling party wishes further attempts made to complete it or if he wishes to cancel the call, and comply with his request.

guide the work of unskilled workmen. Mr. Stephan attempted to show that in his estimate, Mr. Watt figured wages of workmen on the job as being required on the basis of skilled and expert workers.

Testimony on November 14 revealed that estimates of the cost of reproducing the Pacific telephone company's plant in Washington were figured partly on the basis of reproducing old equipment, which no longer is manufactured for use in modern telephone exchanges.

E. R. Cooke, a Western Electric engineer, gave the testimony under cross-examination by J. A. Kavaney, assistant state attorney-general. Mr. Kavaney said the cost of reproducing certain old equipment now in use would be "slightly more" than modern equipment which is installed in newer exchanges.

Arthur D. Codington, building engineer for the Pacific company, called as the next witness by Attorney Otto B. Rupp, representing the company, testified the company's buildings as of December, 1938, were in 97.6 per cent new condition.

I. F. Dix, vice-president and general manager of the company's Washington-Idaho area testified on November 15 that changes being considered by the Pacific company in existing equipment and service would bring a considerable saving. Mr. Dix said changes, including "cutovers" from manual to dial operation in certain areas, have been proposed, but not approved, by the board of directors.

T. R. Hewitt, district maintenance supervisor of Seattle, told of his inspection of all telephone property except buildings, including 6,312 items—automobiles, trucks, tools, poles and other equipment. About 300 of the items were automotive vehicles. Mr. Hewitt testified he based the per cent of condition on the "relationship of existing plant to a property of exact size, type and kind similarly located and 100 per cent new." On this basis, he testified, all the equipment except buildings is in 90 per cent new condition.

Carl I. Wheat cross-examined Mr. Hewitt at length as to how Mr. Hewitt determined the percentage of newness, in making a state-wide survey of telephone equipment. Attorney Wheat sought to find flaws in the methods used in determining the percentage of deterioration.

Surveys made by the Pacific company relative to the value of its equipment were conducted on the basis of judgment by company technicians rather than through physical tests, Mr. Hewitt testified earlier. He said he made a six-months' state-wide inspection of the company's telephone equipment with the aid of 60 assistant inspectors.

Attorney Wheat then asked if physical tests were made of such equipment as aerial cable. Mr. Hewitt responded that the percentage of discount was based on "pure judgment" by the company's technicians.

Mr. Wheat announced on November 17 that private individuals who wish to testify at the rate hearing will be permitted to do so after the conclusion of the Pacific company's case. He said that while the department had hoped to end the hearing by December 1, he now expects the session will extend well into December.

I. F. Dix said that the Pacific T. & T. company provides the department of public service with offices during the


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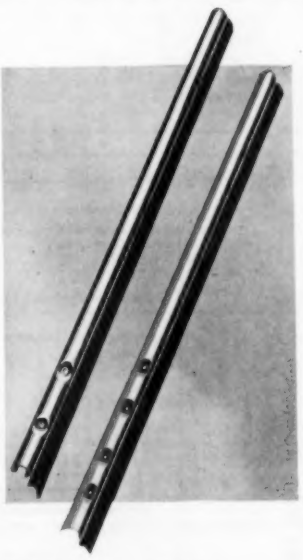

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## "Telephony's" Engineering Data

By B. C. Burden

Index, Drop Wire Construction.
November 25, 1939.
No. 2-B, Page 19.

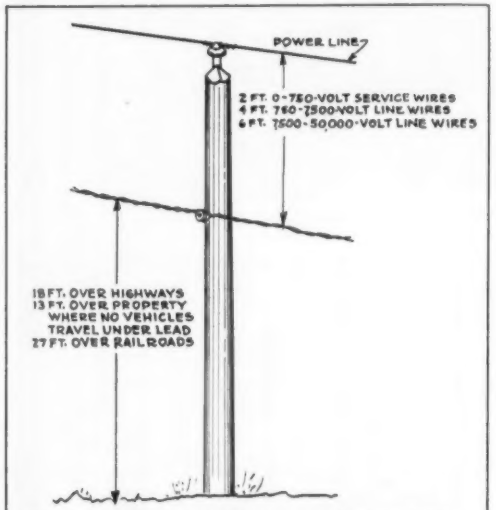
POWER LINE
2 FT. 0-750-VOLT SERVICE WIRES
4 FT. 750-7500-VOLT LINE WIRES
6 FT. 7500-50,000-VOLT LINE WIRES
18 FT. OVER HIGHWAYS
13 FT. OVER PROPERTY WHERE NO VEHICLES TRAVEL UNDER LEAD
27 FT. OVER RAILROADS

FIG. 21. VERTICAL CLEARANCE REQUIREMENTS FOR DROP WIRES.

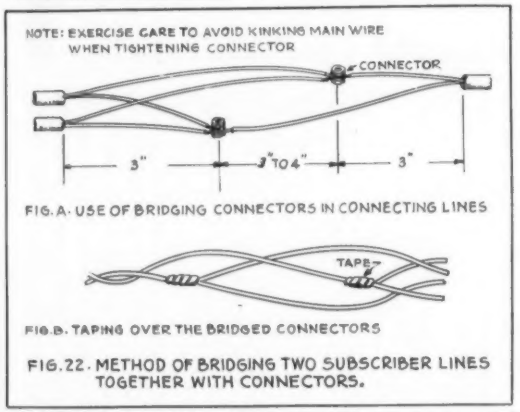


FIG. A. USE OF BRIDGING CONNECTORS IN CONNECTING LINES

FIG. B. TAPING OVER THE BRIDGED CONNECTORS

FIG. 22. METHOD OF BRIDGING TWO SUBSCRIBER LINES TOGETHER WITH CONNECTORS.

(Material describing Figs. 21 and 22 appeared in TELEPHONY, November 18.)

"Telephony's" Engineering Data

By B. C. Burden

Index, Drop Wire Construction.
November 25, 1939.
No. 2-B, Page 20.

## Drop Wire Construction Methods (Cont.)

The same procedure is used on twisted-pair drop wire except that it is necessary to tape only over the connector itself and not the entire section in which the splice falls. In bridging one drop to another by this means the bolt of the connector should be held solidly with a pair of pliers when the nut is twisted up to prevent kinking the main drop wire.

As was expressed earlier in this series on drop wire modern practice dictates the use of drop wire clamps, clips and split knobs in place of the older methods of using a short piece of wire to tie the drop wire to the dead-end and to intermediate supports. However, a large percentage of the existing drop-wire installations is of the "tied" type.

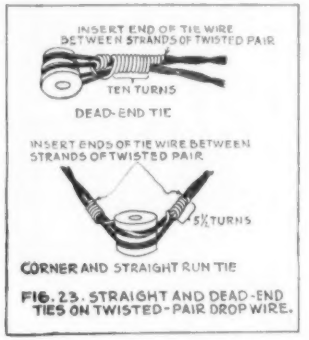
INSERT END OF TIE WIRE BETWEEN STRANDS OF TWISTED PAIR
TEN TURNS
DEAD-END TIE
INSERT ENDS OF TIE WIRE BETWEEN STRANDS OF TWISTED PAIR
5½ TURNS
CORNER AND STRAIGHT RUN TIE

FIG. 23. STRAIGHT AND DEAD-END TIES ON TWISTED-PAIR DROP WIRE.

Therefore, every telephone man should be familiar with the standard method of "tying-in" parallel or twisted-pair drop-wire. An improperly-made tie is apt to allow the drop wire to slip off the support resulting in hazard to the public, or the tie may be made in such manner as to cut through the drop-wire braid and cause maintenance troubles.

Fig. 23 illustrates both the straight and the dead-end tie for twisted-pair drop wire. It should be noted that tie wire of the same material as the drop wire itself should be used. A 32-inch length of wire is required. The five-inch loop shown reduces possibility of the metallic conductor breaking due to being blown back and forth by the wind. This loop is not required where both ends of the dead-ended wire pull away from the knob in the same direction, as shown in Fig. 24.

In making a straight tie on parallel drop wire, a

"Telephony's" Engineering Data

By B. C. Burden

Index, Drop Wire Construction.
November 25, 1939.
No. 2-B, Page 21.

FIG. 24. STANDARD METHOD OF DEAD-ENDING TWISTED-PAIR DROP WIRE.

30-inch length of twisted-pair wire should be used for the tie, which is made as shown in Fig. 25. The same tie may be used for either a straight run or where parallel wire makes a 90-degree turn. For dead-ending parallel wire the tie wire should be three feet long. If the span wire and service wire pull away from the knob in the same direction, no loop is needed.

On new drop installations it is usually possible to place the drop in one piece thus avoiding the necessity of a splice. However, in connection with repair work and in the utilization of salvaged drop wire it may be necessary to make a splice. There are three methods of connecting a drop-wire conductor together mechanically: (1) by a simple Western Union hand-twisted splice; (2) by means of double-tube sleeves, and (3) by means of single-tube compression type sleeves.

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Seattle hearing because the company is required to do so. "Under the law we must pay the expenses of the department's investigation," Mr. Dix pointed out. "We are obligated to provide the offices for the department."

## Summary of Commission Rulings and Hearings

***Federal Communications Commission***

November 9: Chesapeake & Potomac Telephone Co. of West Virginia given authority to supplement existing facilities between Wellsburg and Weirton, W. Va., a distance of approximately 4.9 miles.

November 17: Hearing on petition of Public Utilities Commissioner of Oregon for leave to intervene in proceedings of Washington Department of Public Service against the Pacific Telephone & Telegraph Co. regarding interstate toll rates.

***Alabama Public Service Commission***

November 3: Frankville Telephone Co., Washington county, given authority to construct a direct metallic line connecting Chatom and the Southern Bell Telephone & Telegraph Co.'s Mobile line at Fruitdale.

***Kansas Corporation Commission***

November 16: Complaint of Mason McComb against boundary lines of Southwestern Bell Telephone Co. and the Western Light & Telephone Co. withdrawn.

November 23: Hearing on application of Central Kansas Telephone Co., Inc., for authorization to discontinue its Linwood exchange.

December 5: Hearing on application of Mr. and Mrs. R. P. Van Riper doing business as the Penalosa Telephone Co. for permission to cease operating as a public utility telephone company in Penalosa and vicinity.

December 12: Hearing on application of the American Telephone Co. for permission to install automatic dial service at its Powhattan exchange and file a new schedule of rates to be effective upon the establishment of the new service.

***Michigan Public Service Commission***

November 13: Lake City Telephone Co. authorized to purchase and Town Line Telephone Co. authorized to sell all of its physical assets. Lake City rates are to be charged and collected within the territory previously served by the Town Line company, save certain exceptions as set forth in the order. About 18 customers are affected.

November 28: Hearing in Lansing on rates and services of the Moore Telephone System at the state farm colony, Wahjamega.

December 1: Hearing in Lansing on application of Citizens Telephone Co. of Berrien county to purchase certain property from the Michigan Bell Telephone Co.

December 1: Hearing in Lansing on application of Michigan Bell Telephone Co. for authority to enlarge Grand Rapids base-rate area.

***Minnesota Railroad & Warehouse Commission***

November 14: Zumbrota Telephone Co. given authority to change its schedule of rates at Zumbrota.

November 14: Farmers Mutual Telephone Co. given authority to change schedule of rates at its Wanamingo exchange.

***Nebraska State Railway Commission***

November 13: Application of the Northwestern Bell Telephone Co. for authority to establish a metallic rural rate at its Belgrade exchange taken under advisement pending further investigation. Commissioner Good motioned that where service is restricted to local exchange, the rate be $2.25 per month with a 25-cent additional charge where Cedar Rapids service is offered. His motion lost because rate differential was too small.

November 13: Objections of Glenwood Telephone Co. to construction of parallel lines by Southern Nebraska Rural Public Power District sustained and district ordered to de-energize lines by December 13.

***New York Public Service Commission***

November 21: Hearing in Albany on motion of the commission as to accounts and records of Tri-State Associated Telephone Corp.

November 22: Hearing in New York in proceeding on motion of the commission as to proposed changes by the New York Telephone Co. in its telephone directory for Westchester county. Continued from November 17.

***North Carolina Utilities Commission***

November 1: The Central Electric & Telephone Co. applied for authority to eliminate a 25-cent monthly charge for handsets in Leaksville and Mount Airy and to increase other charges slightly.

***Ohio Public Utilities Commission***

November 13: Ohio Bell Telephone Co. given authority to revise the base-rate areas of its Canal Winchester, New Albany and Osborn exchanges by adding rural territory wherein demand has arisen for base-rate area service


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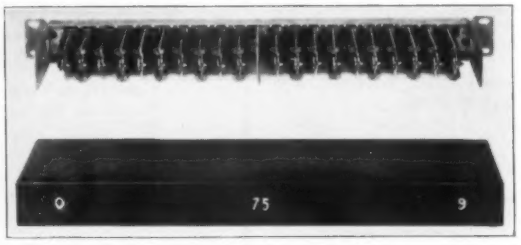


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and excluding undeveloped territory in each exchange.

November 16: The New Concord Telephone Co. applied for authority to issue and sell at par $2,100 of 10-year, 6 per cent notes to procure money with which to reimburse its treasury for uncapitalized capital expenditures as of April 30, 1938, and a finding that such expenditures as of that date amounted to $507.09. Authority was granted to issue and dispose of $500 of the notes.

November 16: Citizens Telephone Co. of Circleville given authority to issue and sell $14,100 of 10-year, 6 per cent notes. Uncapitalized capital expenditures as of April 30, 1938, amounted to $14,121.67. The company had requested authority to issue $32,000 in notes.

November 16: New Bremen Telephone Co. given authority to issue and sell $200 of 10-year, 6 per cent notes. As of April 30, 1938, the uncapitalized capital expenditures amounted to $208.61. The company had requested authority to issue and sell $3,400 of 10-year, 6 per cent notes.

November 17: Joint application filed by the Ohio Associated Telephone Co., and Scott Home Telephone Co., to purchase and to sell all of the property of the latter for a consideration to be determined by the commission.

***Wisconsin Public Service Commission***

November 14: Commonwealth Telephone Co. given authority to purchase for $570 a portion of the Bloomfield Telephone Co. lines in Dodgeville and Linden, Iowa county. Subscribers of the Bloomfield company agreed to pay the Commonwealth company's Dodgeville exchange rate of $2.00 per month.

November 15: Commonwealth Telephone Co. given authority to increase rates at its Newburg and Wauzeka exchanges. The commission found present rates to be inadequate to produce a fair return on the company's property. The new rates at the two exchanges are: Residence, one-party, $2.00; two-party, $1.75; four-party, $1.50; business, one-party $2.75, and two-party $2.25.

November 20: Hearing in Madison on application of La Crosse Telephone Corp. for authority to increase, alter and amend its rates and schedules for the furnishing of local service and to establish a uniform system of rules and regulations at its La Crosse, West Salem, Viola, DeSoto, Onalaska, Genoa, Barre Mills and Readstown exchanges.

November 24: Hearing in Ellsworth on application of the Community Telephone Co. of Wisconsin for authority to sell or abandon its exchange in Waverly, or to increase rates.

November 28: Hearing in Madison on proposal of Amery Electric Co. to purchase the Shiloh Mutual Telephone Co., Polk county, and apply the Amery company's rates to Shiloh subscribers. The purchase price will be in the form of credit allowances to the 11 members of the mutual company who will pay only 50 cents a month for telephone service for the next two years. At the end of two years regular rates will be resumed.

The Shiloh company desires to sell its property because it has no funds for needed repairs and for making the lines metallic to overcome interference from nearby electric lines.